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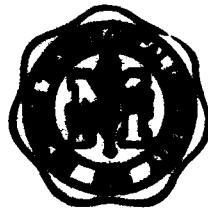
DTIC FILE COPY

DEVELOPMENT of a PREDICTIVE MODEL to
ASSESS the EFFECTS of EXTENDED SEASON
NAVIGATION on
GREAT LAKES CONNECTING WATERS

AD-A202 197

APPENDIX A

Site and Soil Conditions



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Michigan Technological University

Houghton, Michigan

October 1985



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Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

Form Approved
OMB No. 0704-0188

REPORT DOCUMENTATION PAGE

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13a. TYPE OF REPORT Final		13b. TIME COVERED FROM _____ TO _____	
14. DATE OF REPORT (Year, Month, Day) October 31, 1985		15. PAGE COUNT 78	
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17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) St. Marys River System, Computer Model, Winter Navigation, Sediment Translocation, Water Quality, Structure Damage, Hydraulic Changes	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The object of this study was to develop a method for forecasting the physical effects of the passage of commercial vessels through Great Lakes connecting waters during that period of time when traffic is normally at a minimum due to a more or less continuous ice cover. The physical impacts examined were sediment translocation, water quality effects, direct damage to existing structures, and changes in the gross hydraulic regime. Also associated with Appendix A but bound separately are; Development of a Predictive Model to Assess the Effects of Extended Season Navigation on Great Lakes Connecting Waters, Final Report; the User's Manual for Prediction of Vessel Impacts in a Confined Waterway; Appendix B, Observed Vessel Induced Water Level Drawdowns; and Appendix C, Observed Ice Thicknesses and Water Turbidities.			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
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22c. OFFICE SYMBOL CENCE-PD-EA			

DEVELOPMENT OF A PREDICTIVE MODEL TO
ASSESS THE EFFECTS OF EXTENDED SEASON
NAVIGATION ON
GREAT LAKES CONNECTING WATERS

APPENDIX A
SITE AND SOIL CONDITIONS

by Ralph J. Hodek
George R. Alger
Henry S. Santeford

Submitted to the U.S. Army Cold Regions
Research and Engineering Laboratory
in partial fulfillment of
Contract No. DACA89-85-k-0001

Michigan Technological University
Houghton, Michigan

October 31, 1985

From 1473

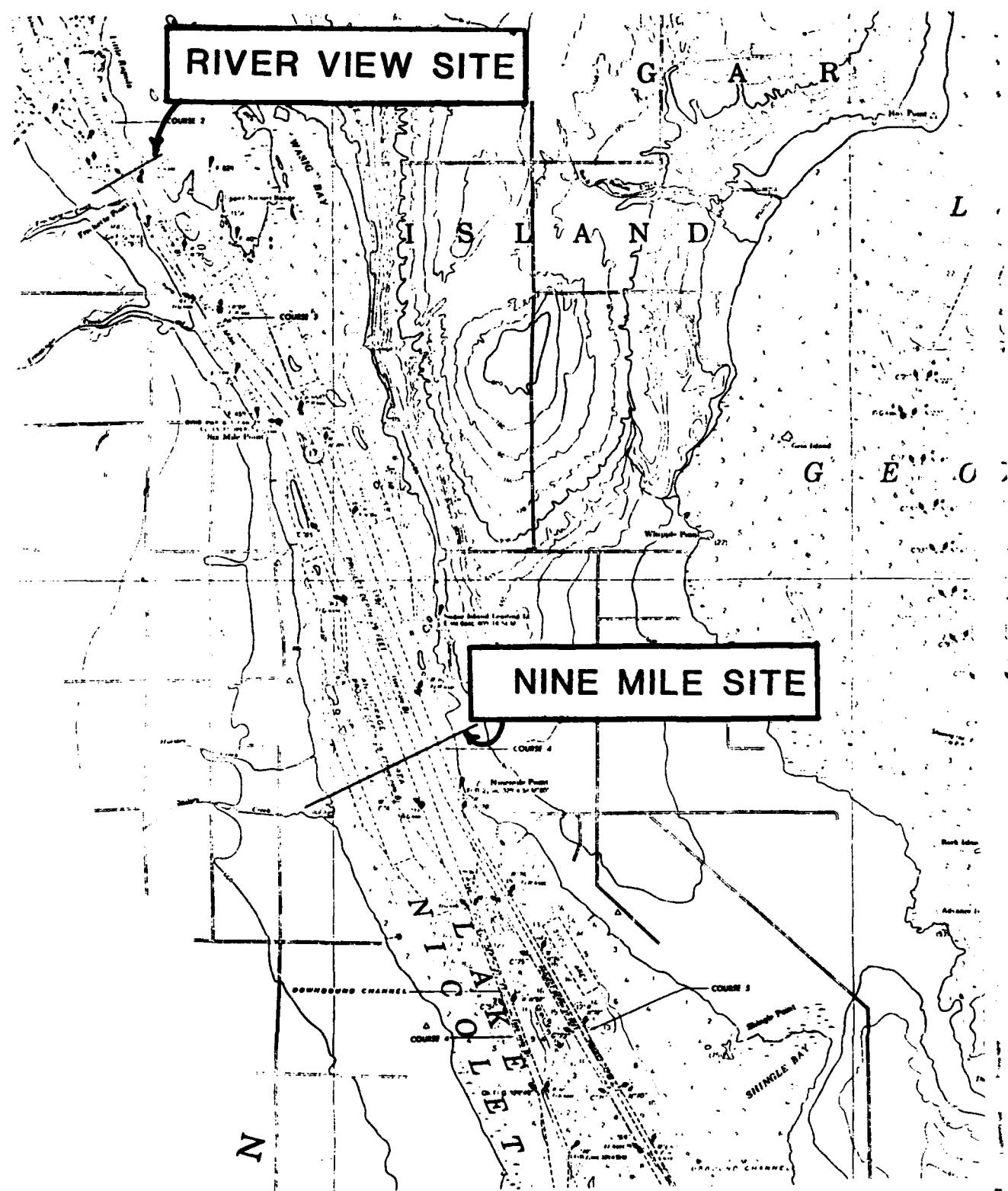
This appendix contains the general locations of all data gathering sites used along the St. Mary's River as shown on portions of NOAA Great Lakes chart 14883. The general site locations are followed by detailed data arranged by site.

Individual site data includes all soil data collected, detailed cross-section information as appropriate, and the specific locations of light extinction and turbidity data acquisition for the Lake Nicolet and Lake Munuscong sites. The light extinction and turbidity data are located in Appendix C. (PL)

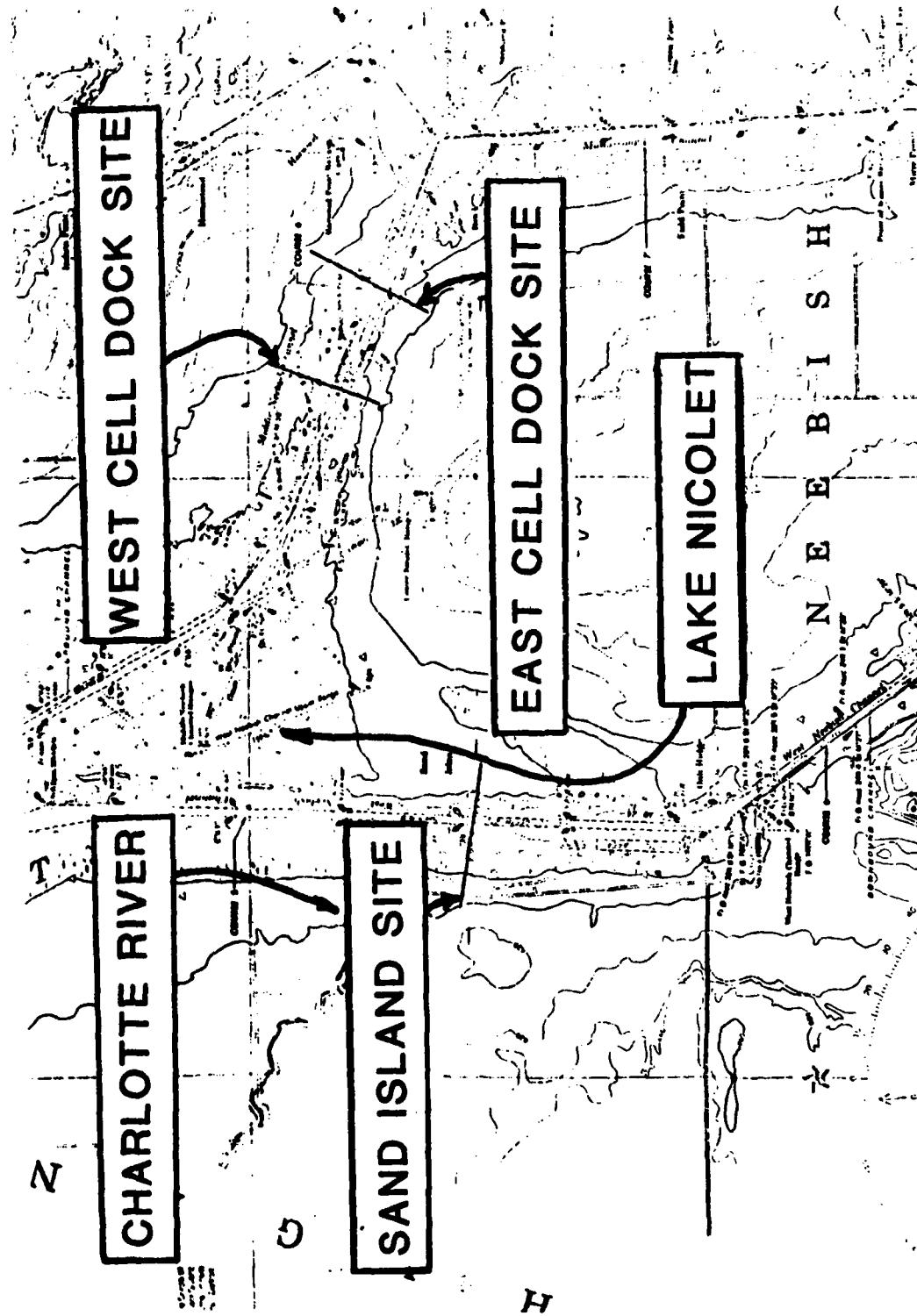
The "green side" or "red side" referred to in much of the data defines the side of the channel at which the data were collected. Facing upstream the red side is to the right and the green side is to the observer's or vessel's left.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

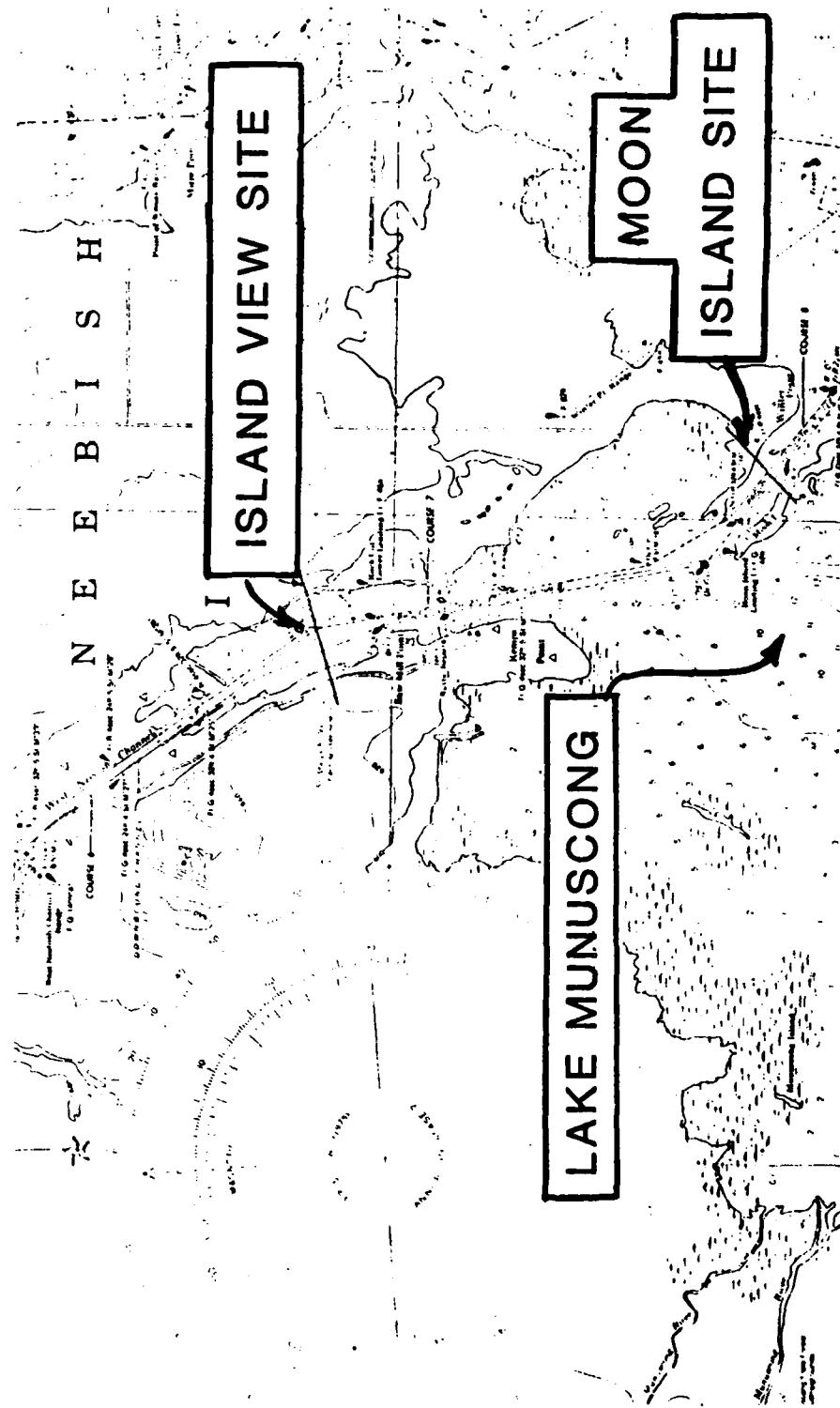




Site Locations in the Northern Portion of the Study Area

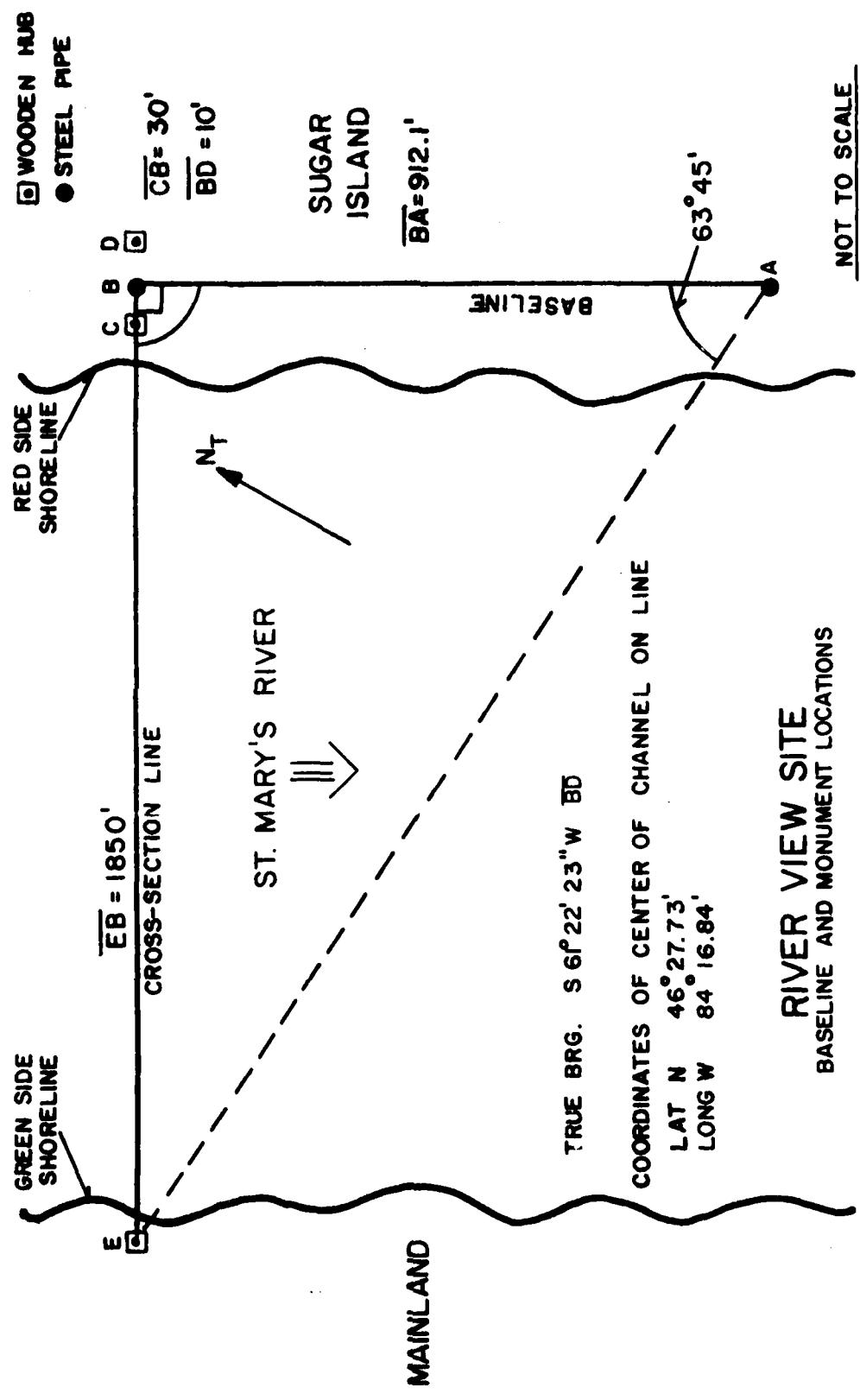


Site Locations in the Central Portion of the Study Area



Site Locations in the Southern Portion of the Study Area

RIVER VIEW



oooooooooooooooooooooo
SOUNDING DATA

NAME OF SECTION RIVER VIEW
oooooooooooooooooo

DATE OF SOUNDING NOVEMBER 8, 1984

WATER SURFACE ELEVATION in feet = 97.6

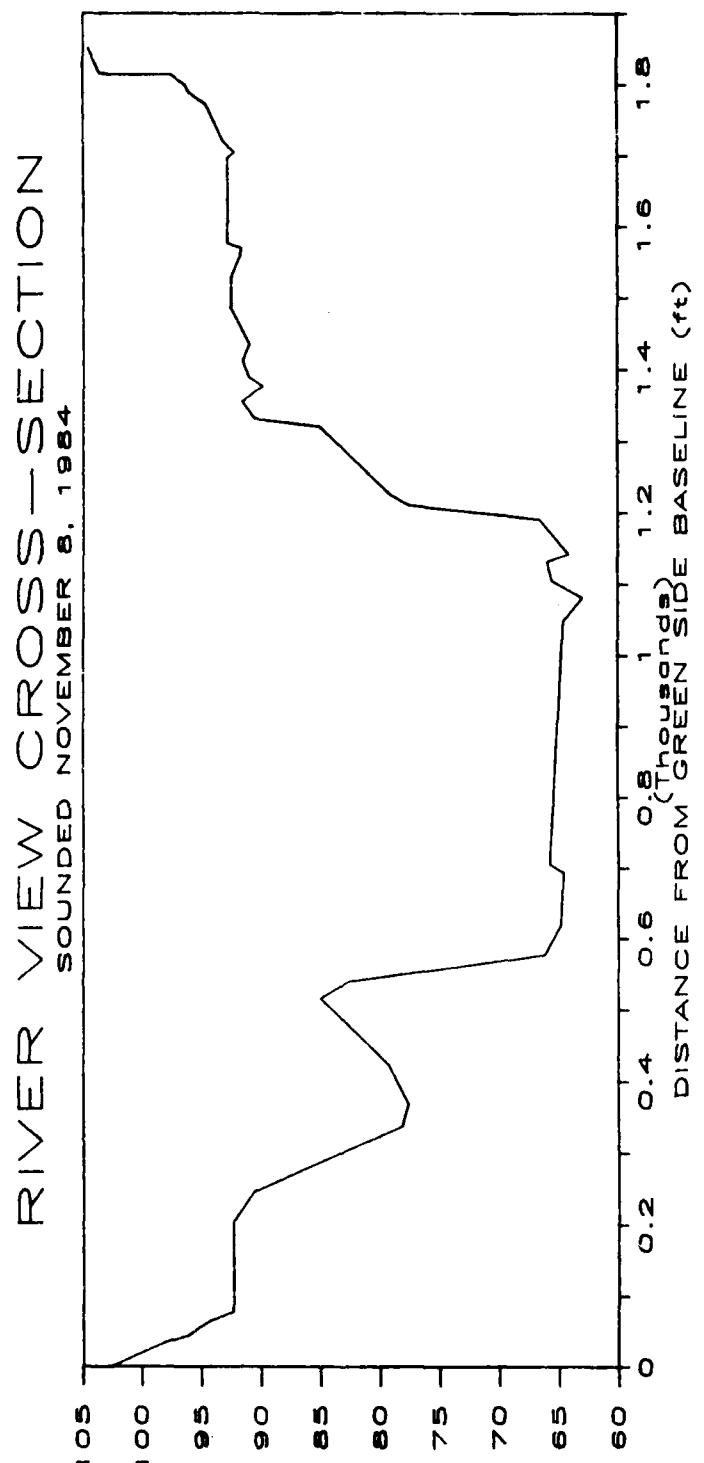
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
E	0.0	102.6
2	37.0	97.6
3	45.0	96.1
4	55.0	95.3
5	65.0	94.3
6	78.0	92.3
7	110.0	92.3
8	205.0	92.3
9	248.0	90.6
10	338.0	78.1
11	368.0	77.6
12	424.0	79.3
13	517.0	85.0
14	540.0	82.6
15	577.0	66.2
16	620.0	64.8
17	693.0	64.6
18	705.0	65.8
19	801.0	65.4
20	1049.0	64.6
21	1081.0	63.0
22	1106.0	65.6
23	1132.0	66.0
24	1142.0	64.2
25	1191.0	66.6
26	1211.0	77.6
27	1225.0	79.1
28	1322.0	85.1
29	1333.0	90.6
30	1357.0	91.6
31	1378.0	89.9
32	1391.0	91.1
33	1412.0	91.6
34	1425.0	91.3
35	1436.0	91.0
36	1488.0	92.6
37	1528.0	92.6
38	1558.0	91.8
39	1570.0	91.7
40	1577.0	92.9

AA2

oooooooooooooooooooooo
SOUNDING DATA <continued>

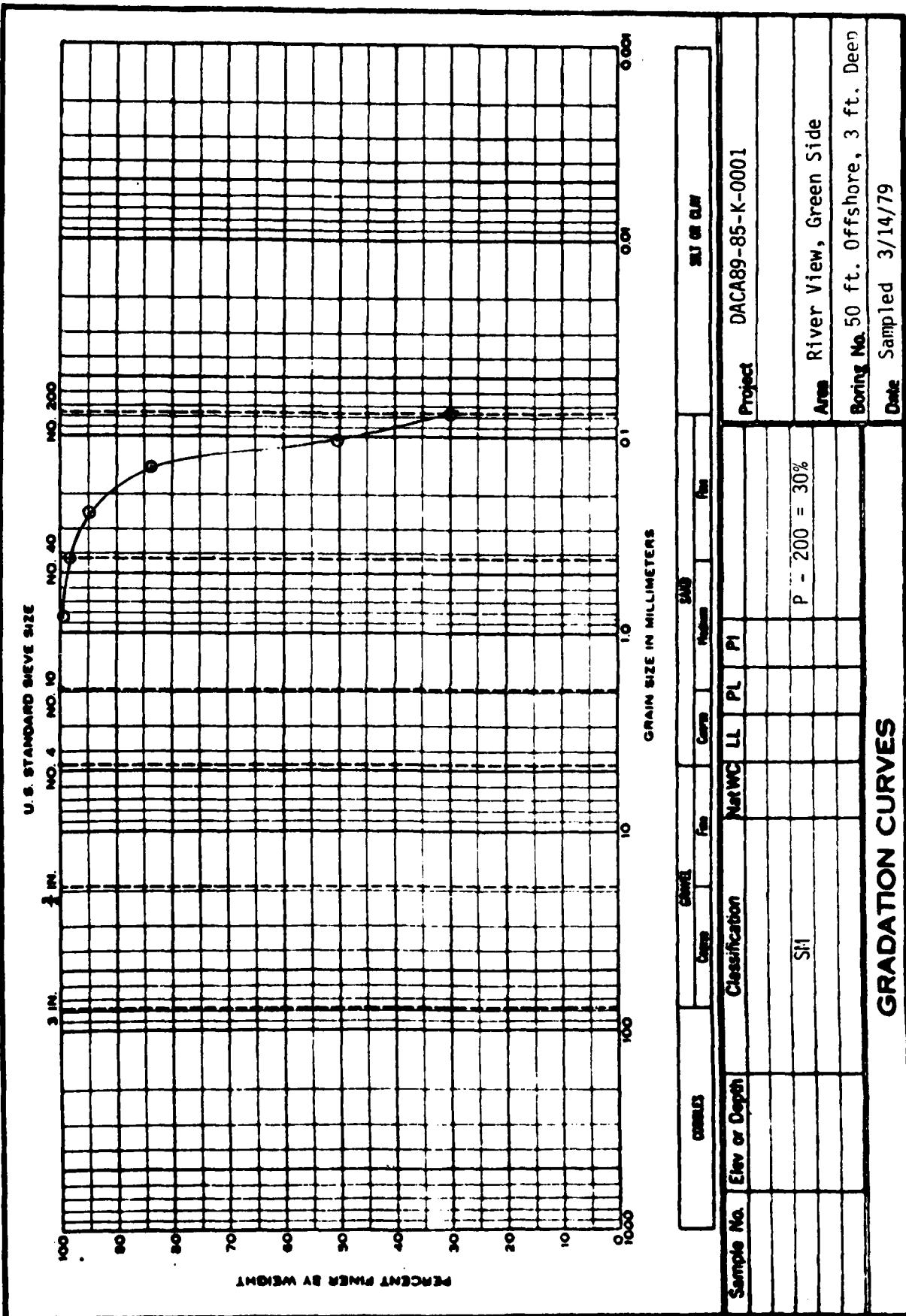
NAME OF SECTION RIVER VIEW
oooooooooooooooooooooo

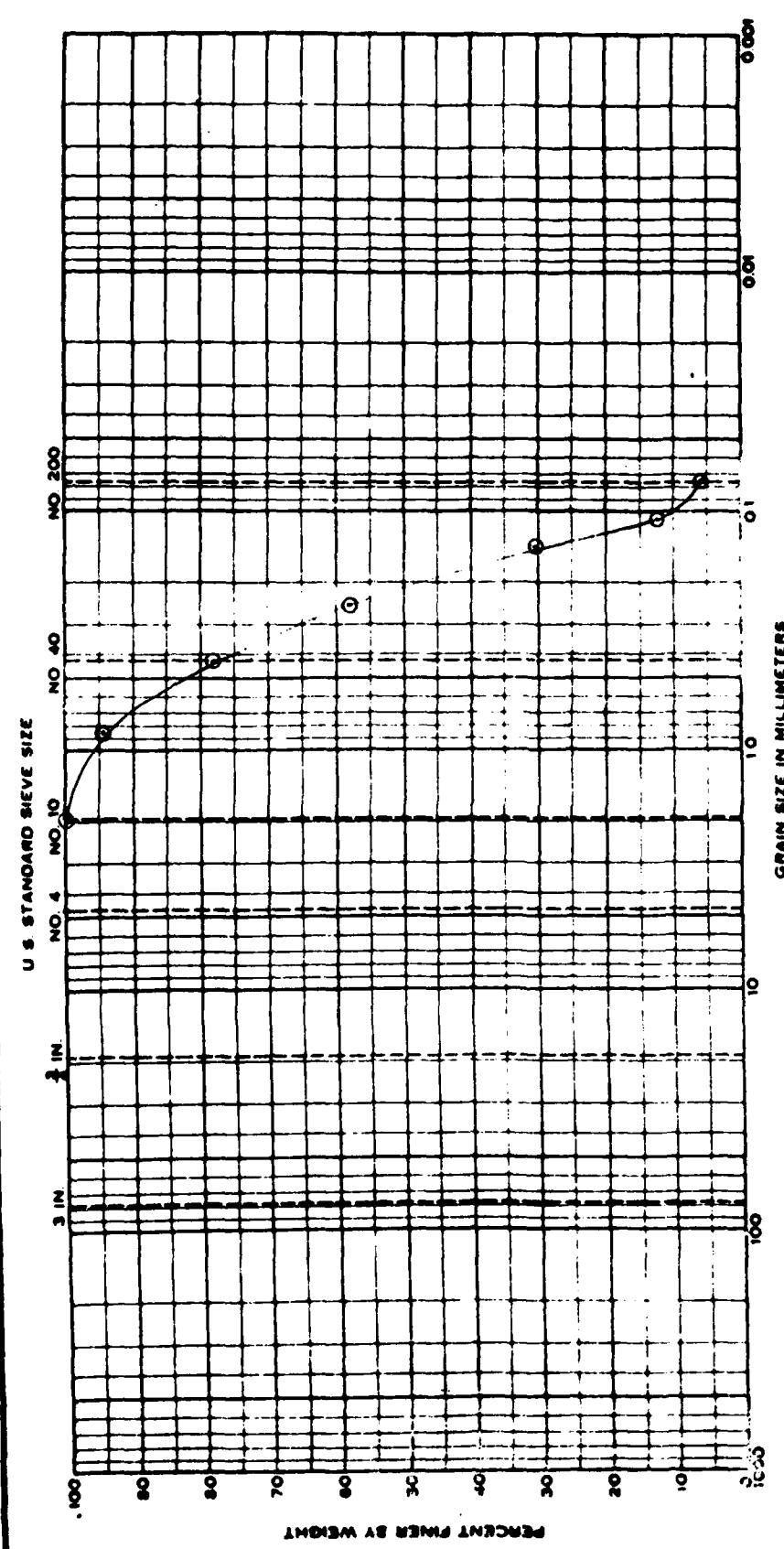
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	1606.0	92.9
42	1697.0	92.9
43	1704.0	92.3
44	1721.0	93.3
45	1772.0	94.7
46	1790.0	96.1
47	1800.0	96.4
48	1813.5	97.6
49	1813.6	102.6
50	1816.0	103.6
B	1850.0	104.6



RIVER BOTTOM ELEVATION (ft)

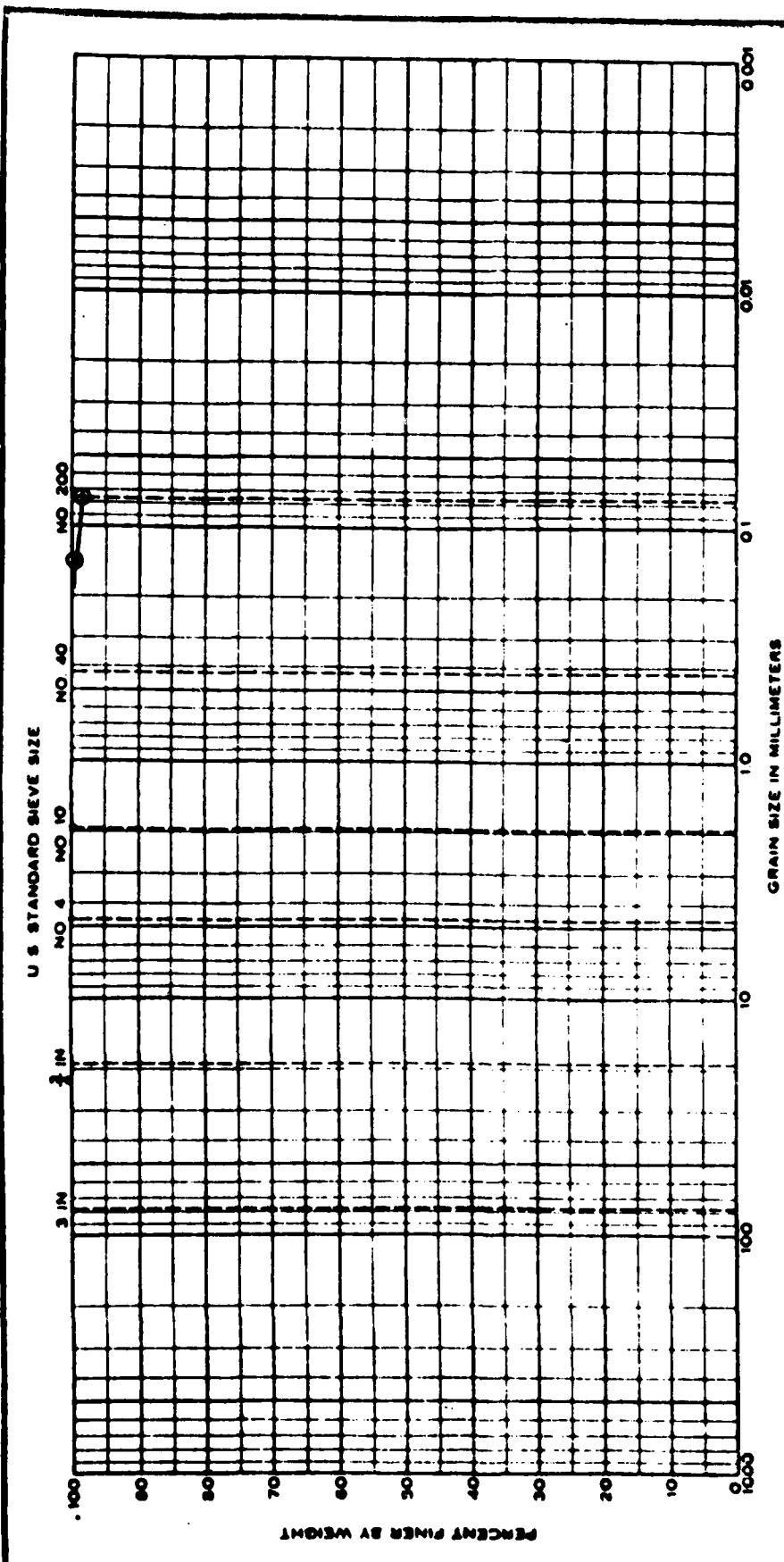
AA4





AA6

GRADATION CURVES

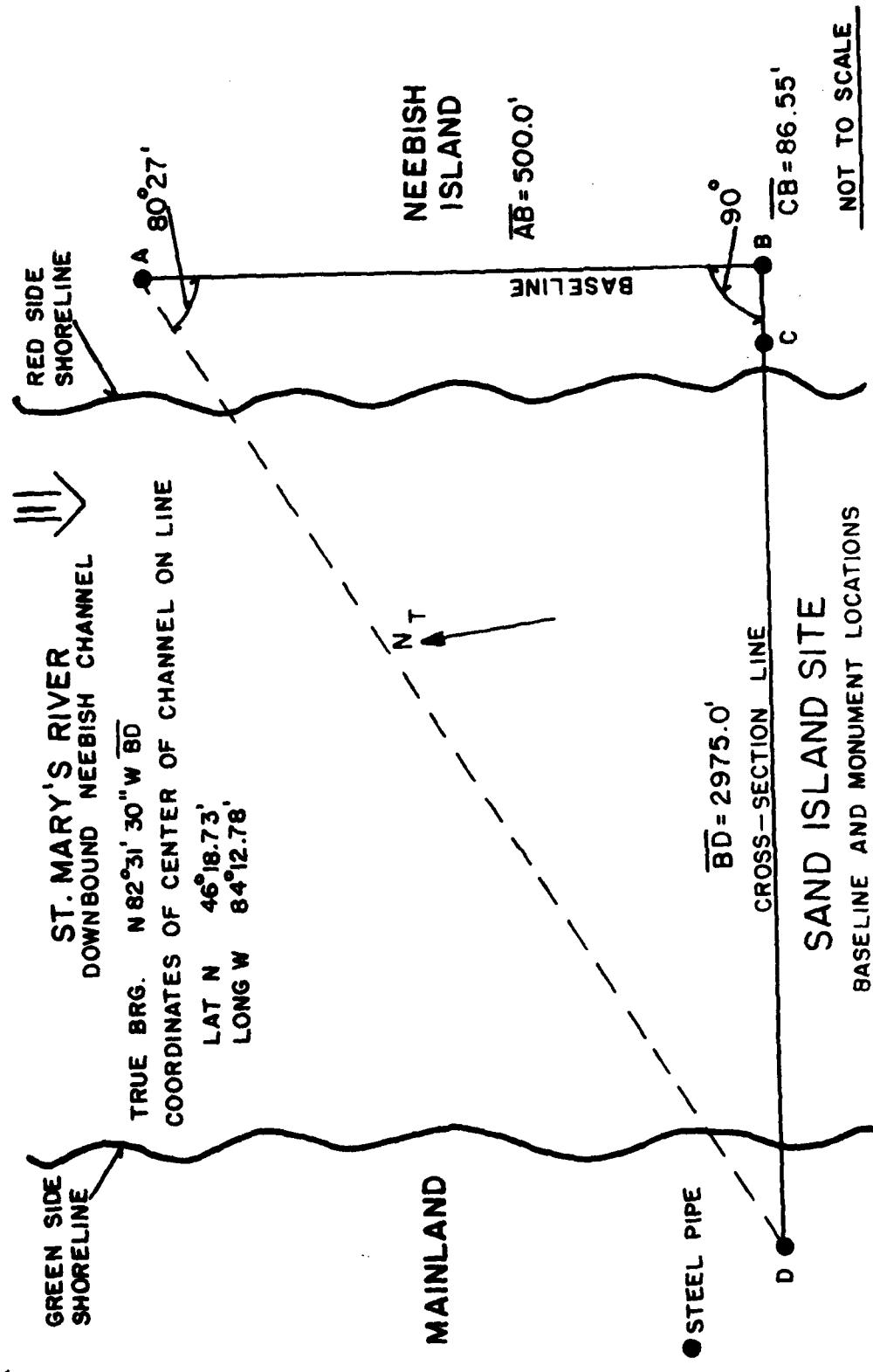


AA7

GRADATION CURVES

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SAND ISLAND



SOUNDING DATA

DATE OF SOUNDING **JULY 26, 1985**

WATER SURFACE ELEVATION in feet = 100

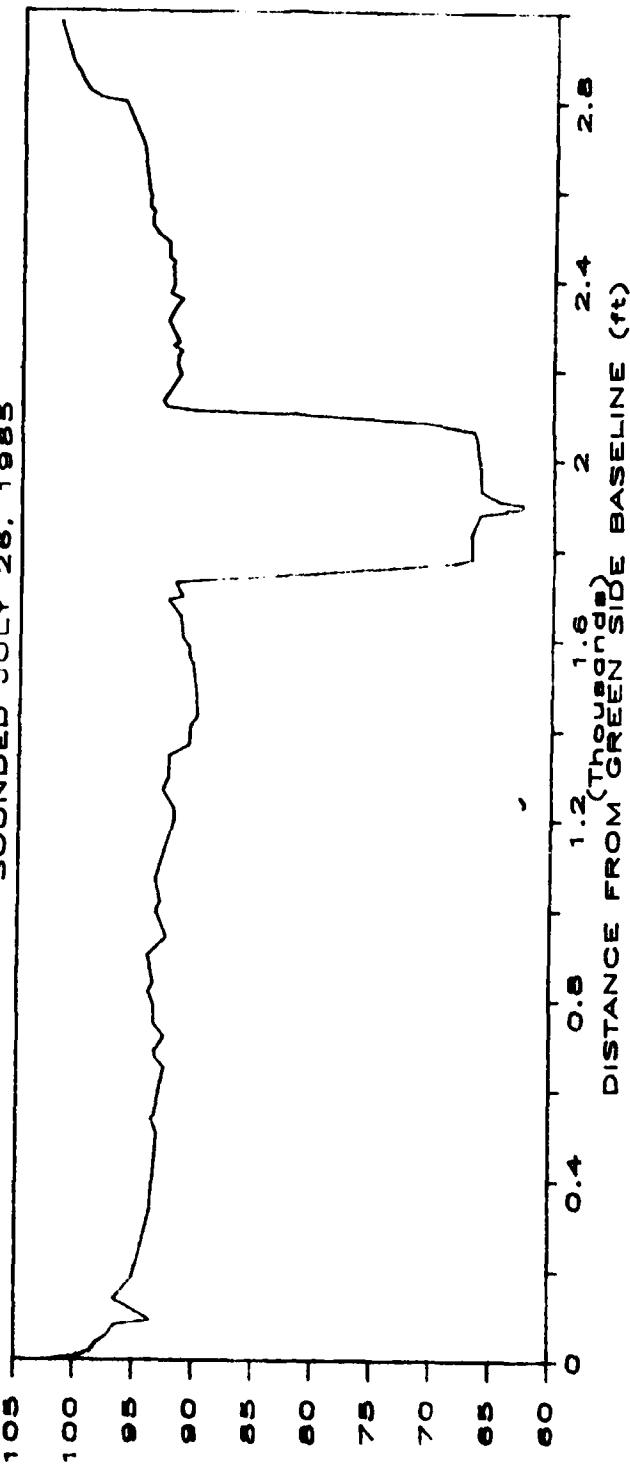
DATA POINT	DISTANCE (ft)	ELEVATION (ft)
D	0.0	102.0
2	11.0	99.5
3	16.0	99.0
4	19.0	98.9
5	20.0	98.6
6	30.0	98.3
7	40.0	98.0
8	50.0	97.5
9	60.0	97.0
10	80.0	96.5
11	90.0	93.5
12	136.4	96.6
13	187.9	95.0
14	333.1	93.6
15	500.7	93.1
16	535.5	93.6
17	542.1	93.3
18	597.2	93.0
19	650.1	92.5
20	668.8	93.3
21	685.0	93.4
22	706.0	92.8
23	719.0	92.6
24	746.0	93.5
25	784.0	93.4
26	818.0	93.9
27	835.0	93.5
28	898.0	94.0
29	939.0	92.4
30	994.0	93.3
31	1016.0	93.0
32	1063.0	93.4
33	1198.0	91.8
34	1226.0	91.9
35	1264.0	92.8
36	1294.0	92.3
37	1343.0	92.2
38	1366.0	90.6
39	1406.0	90.5
40	1432.0	89.9

DATA POINT	DISTANCE (ft)	ELEVATION (ft)
41	1546.0	90.4
42	1561.0	90.7
43	1583.0	90.7
44	1606.0	91.3
45	1651.0	91.5
46	1686.0	92.5
47	1694.0	91.3
48	1725.0	91.9
49	1747.0	80.0
50	1771.0	68.3
51	1782.0	66.9
52	1832.0	67.0
53	1878.0	66.2
54	1885.0	64.0
55	1889.0	64.0
56	1893.0	62.6
57	1903.0	62.7
58	1907.0	64.6
59	1930.0	66.2
60	1982.0	66.3
61	2015.0	66.5
62	2045.0	66.5
63	2063.0	66.8
64	2080.0	70.5
65	2098.0	81.0
66	2105.0	90.2
67	2115.0	92.9
68	2127.0	93.1
69	2185.0	91.6
70	2209.0	91.9
71	2226.0	91.9
72	2240.0	91.6
73	2251.0	92.3
74	2259.0	91.8
75	2306.0	92.7
76	2340.0	92.0
77	2355.0	91.5
78	2369.0	92.5
79	2388.0	92.2
80	2410.0	92.3
81	2427.0	92.4
82	2439.0	92.2
83	2450.0	92.7
84	2484.0	92.7

DATA POINT	DISTANCE (ft)	ELEVATION (ft)
85	2501.0	93.6
86	2522.0	94.1
87	2550.0	94.0
88	2564.0	94.4
89	2585.0	94.3
90	2601.0	94.5
91	2706.0	95.0
92	2798.0	96.5
93	2804.0	98.0
94	2808.0	98.6
95	2821.0	99.5
96	2888.0	101.0
B	2975.0	102.0

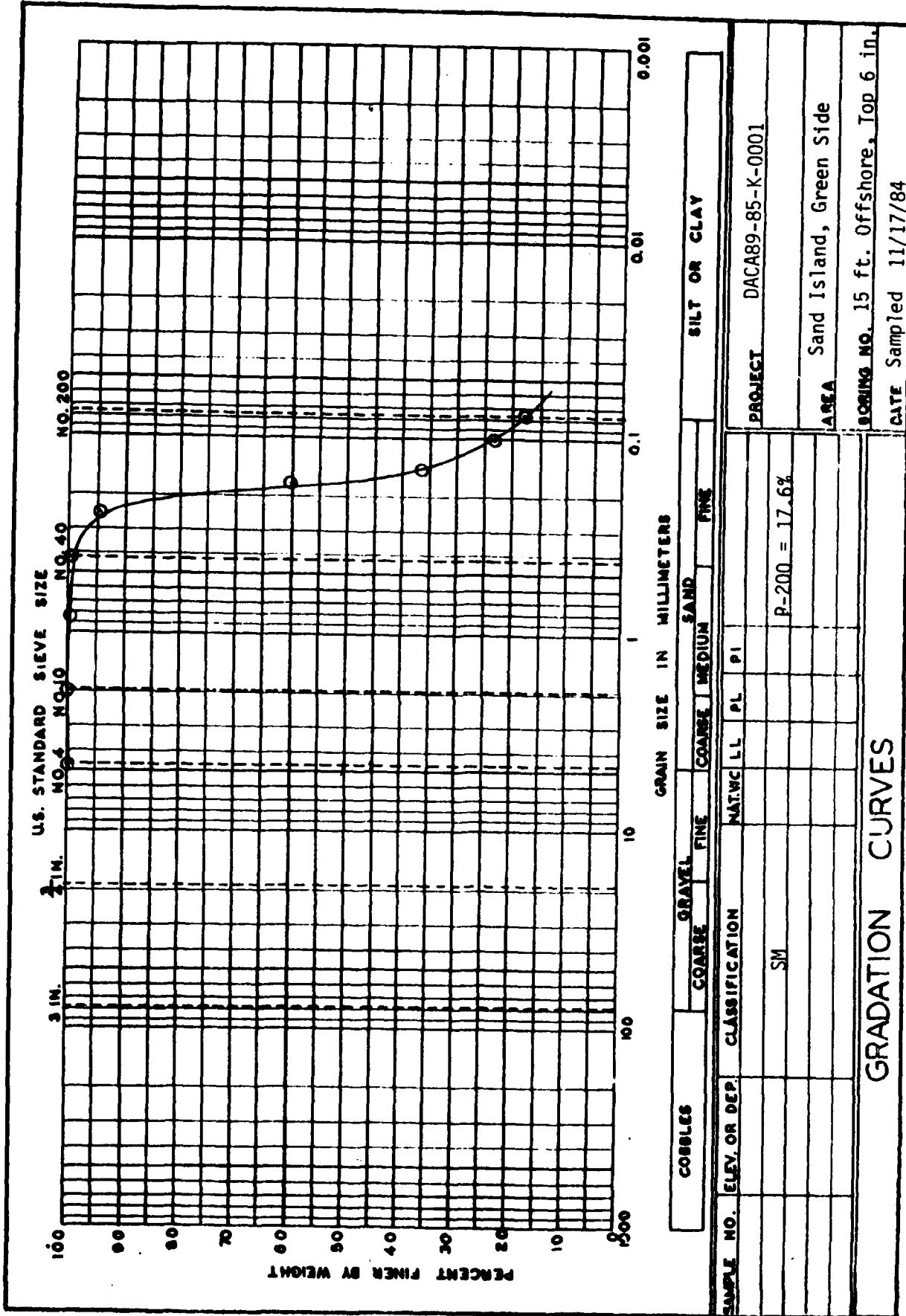
SAND ISLAND CROSS-SECTION

SONDED JULY 28, 1985

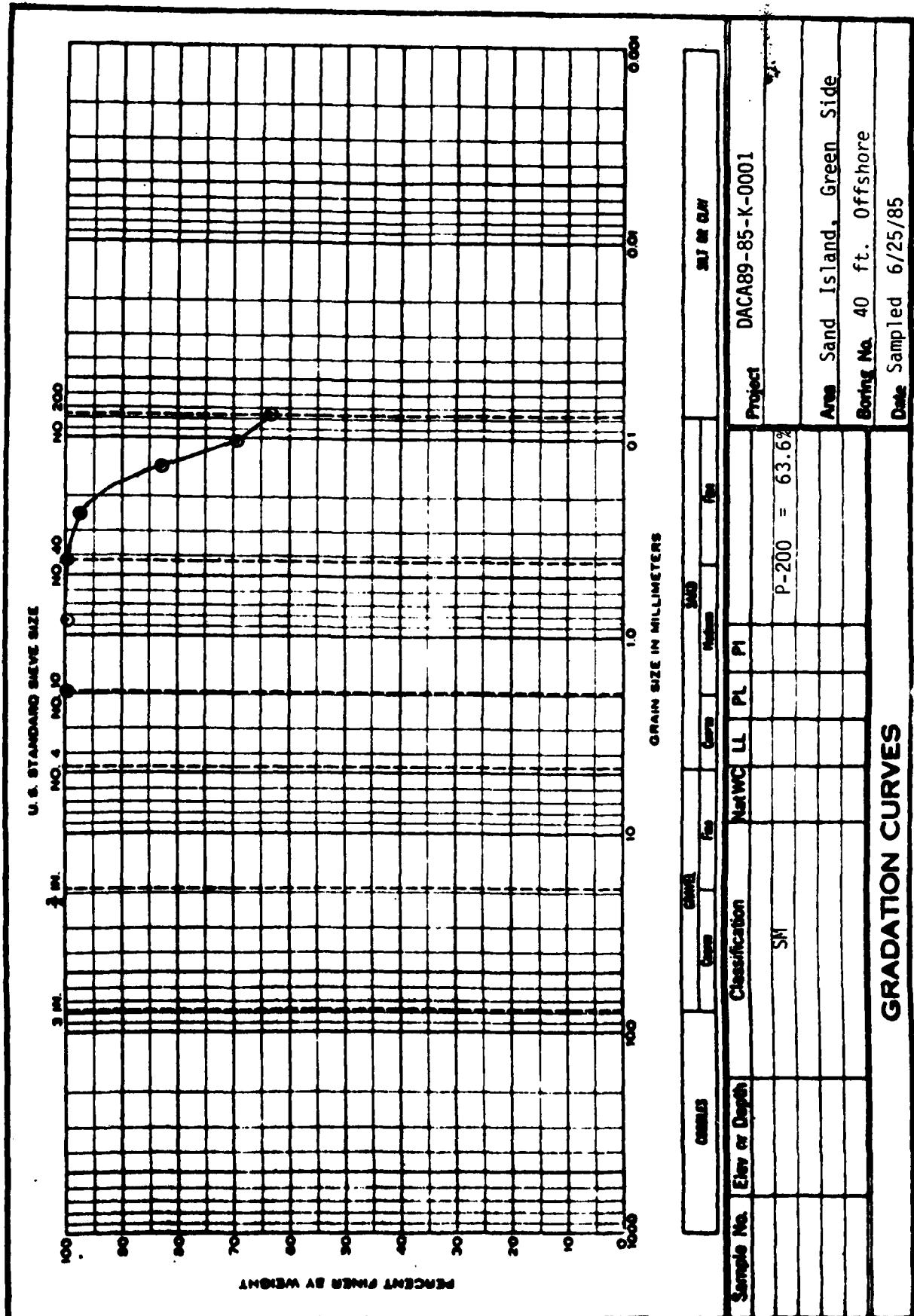


RIVER BOTTOM ELEVATION (ft)

AB5

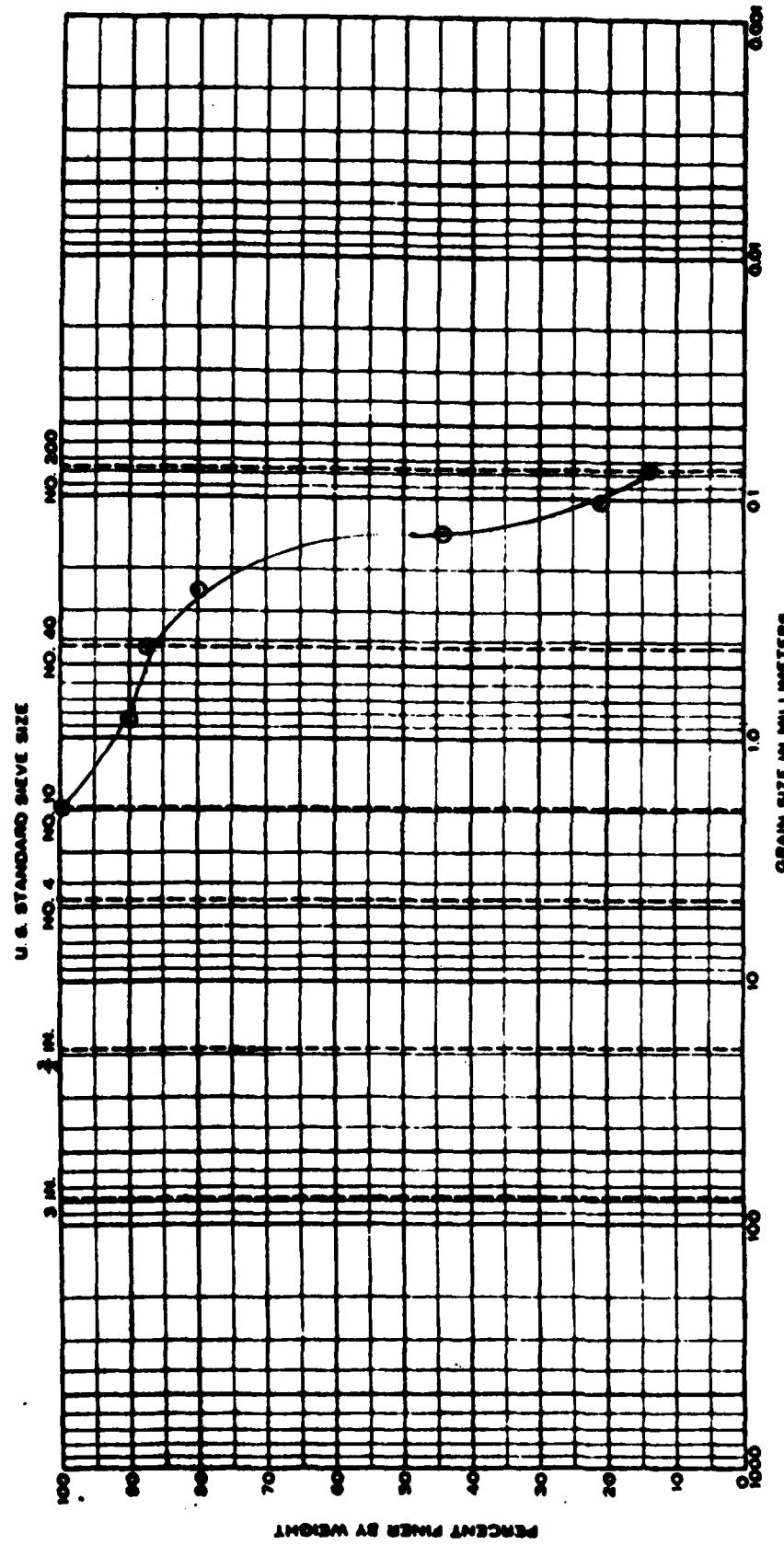


AB6



GRADATION CURVES

AB7



GRADATION CURVES

Sample No. Elev. or Depth Classification $P_{-200} = 13.9\%$

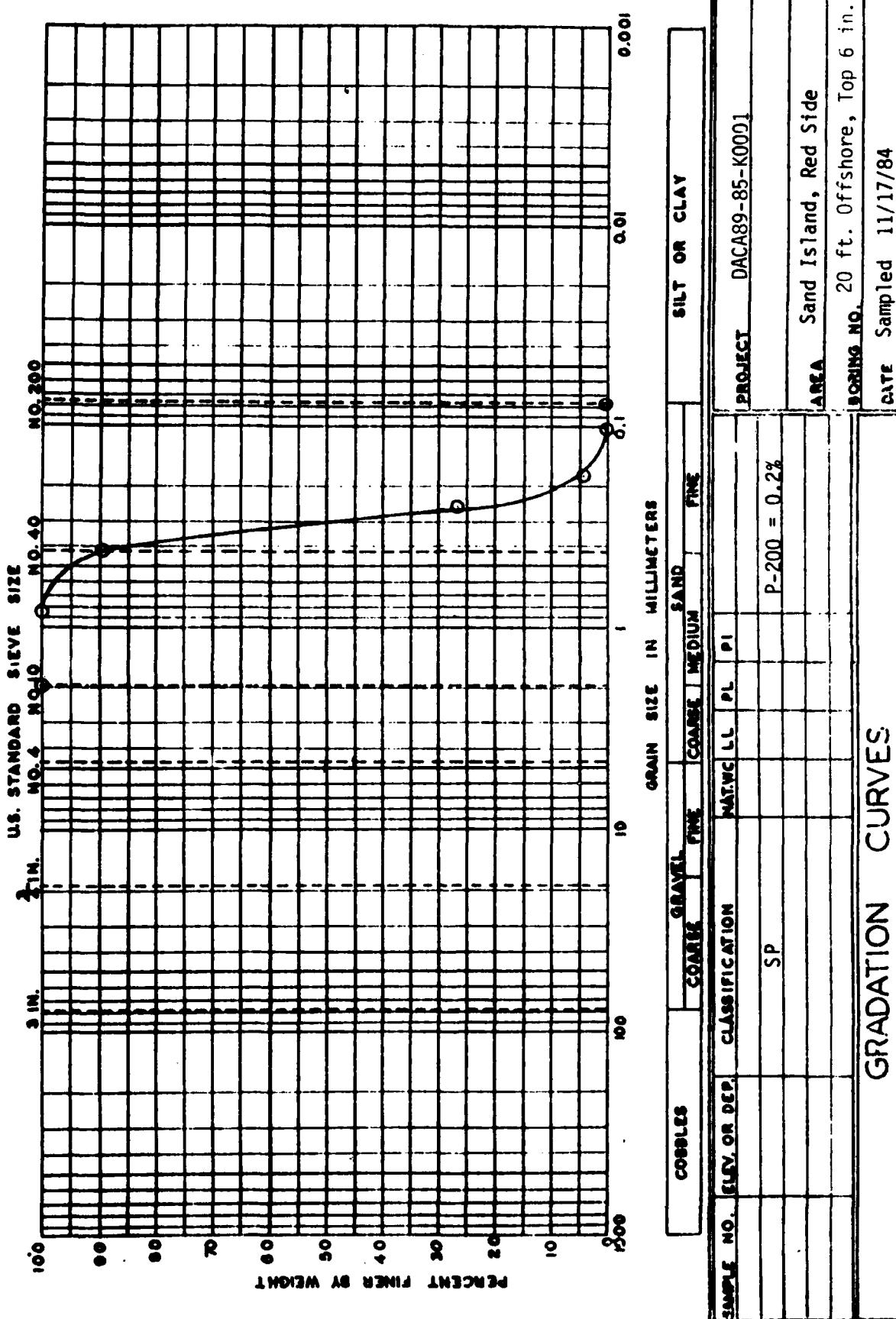
SP-SM

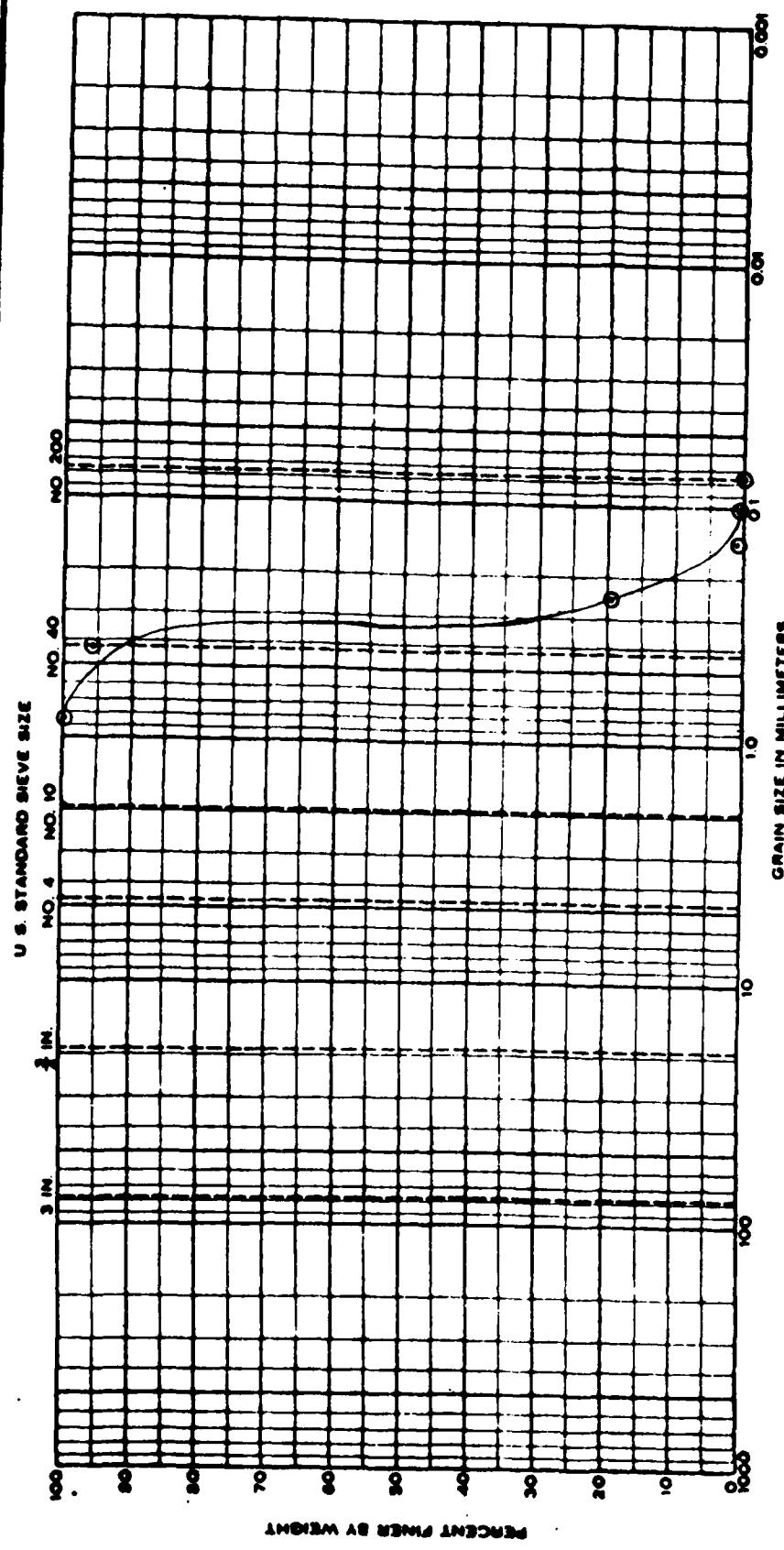
Area Sand Island, Green Side

Boring No. Trap Facing Shore

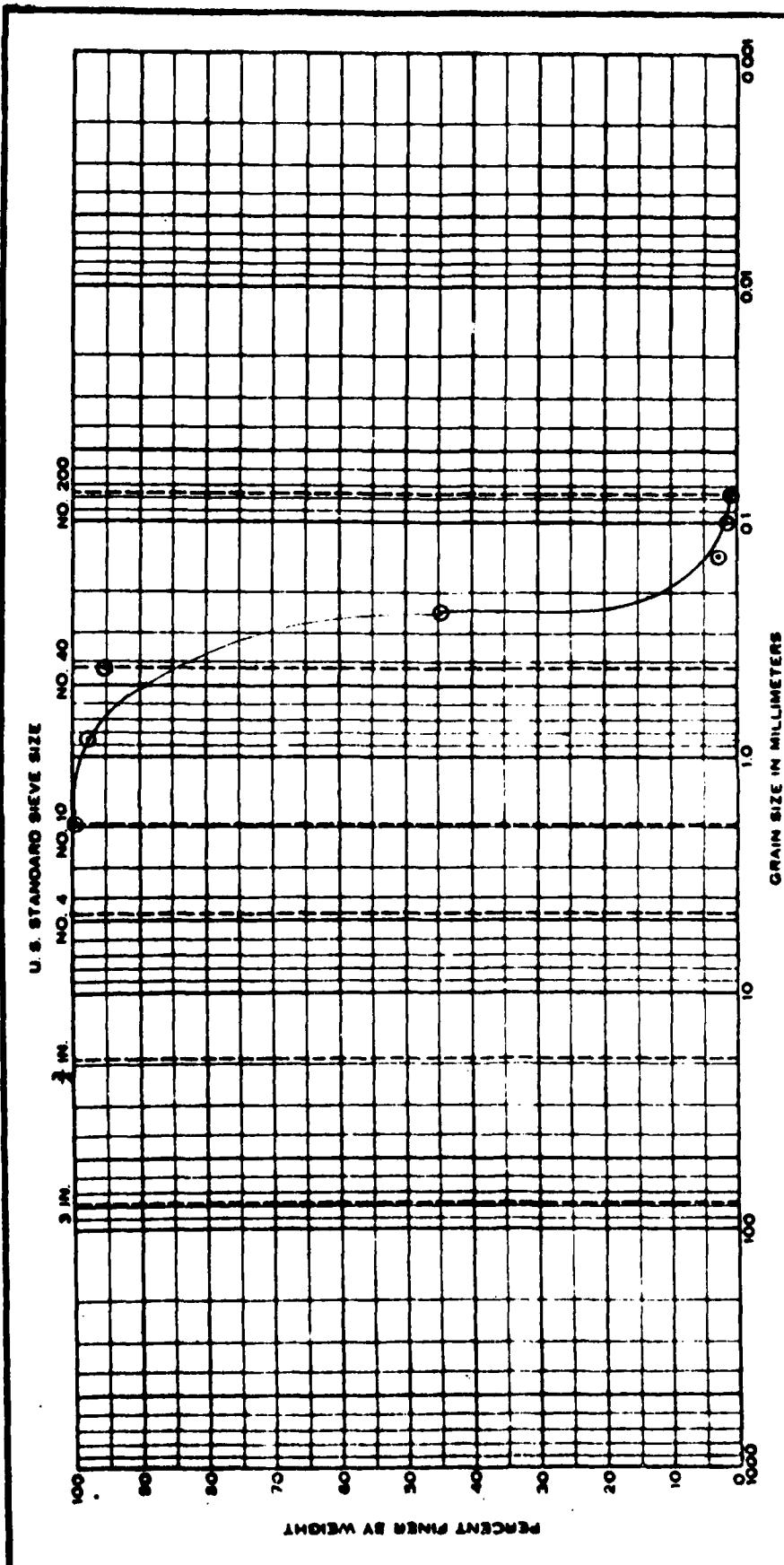
Date J.R. Barker 6/28/85

Project DACA89-85-K-0001



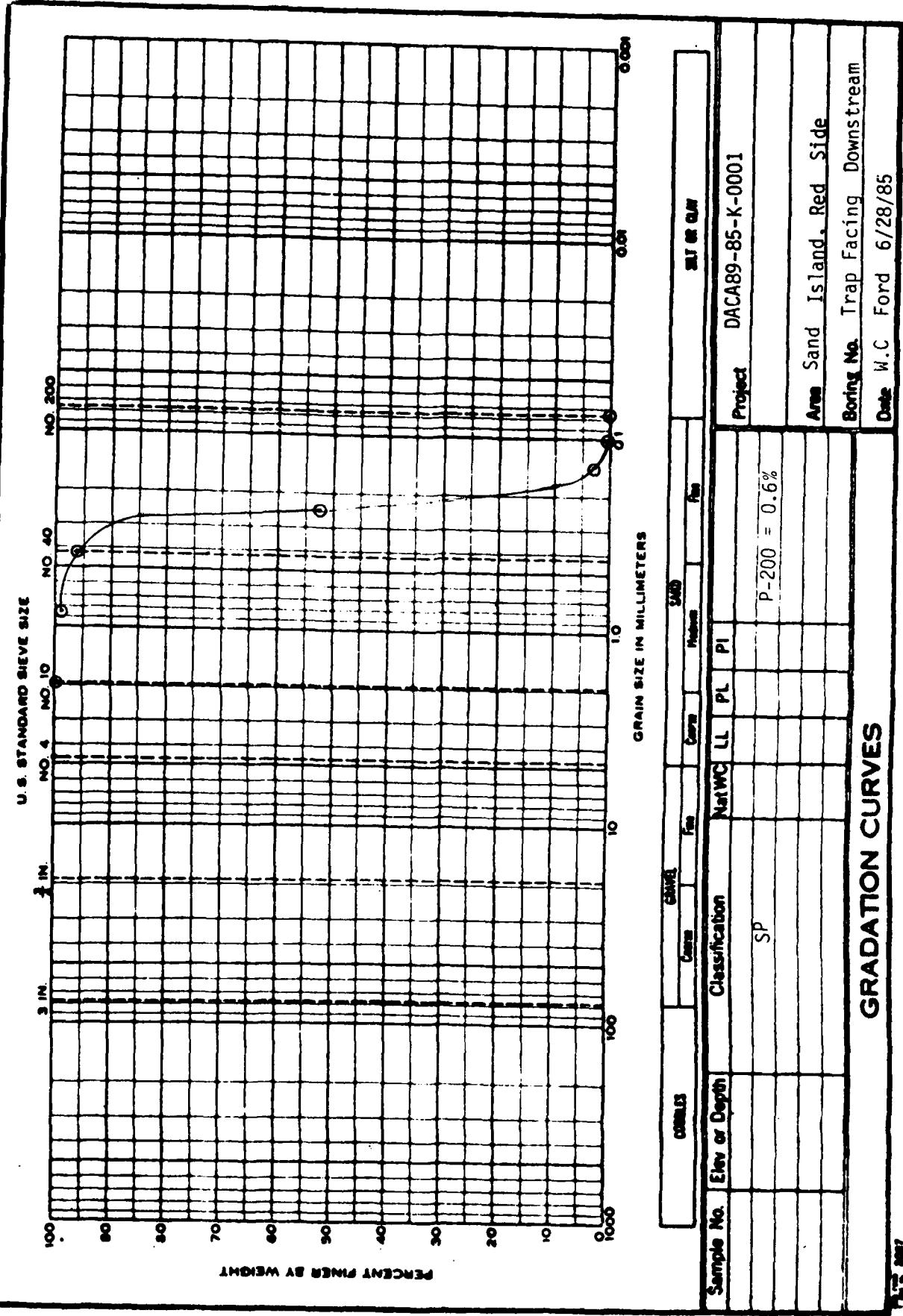


GRADATION CURVES

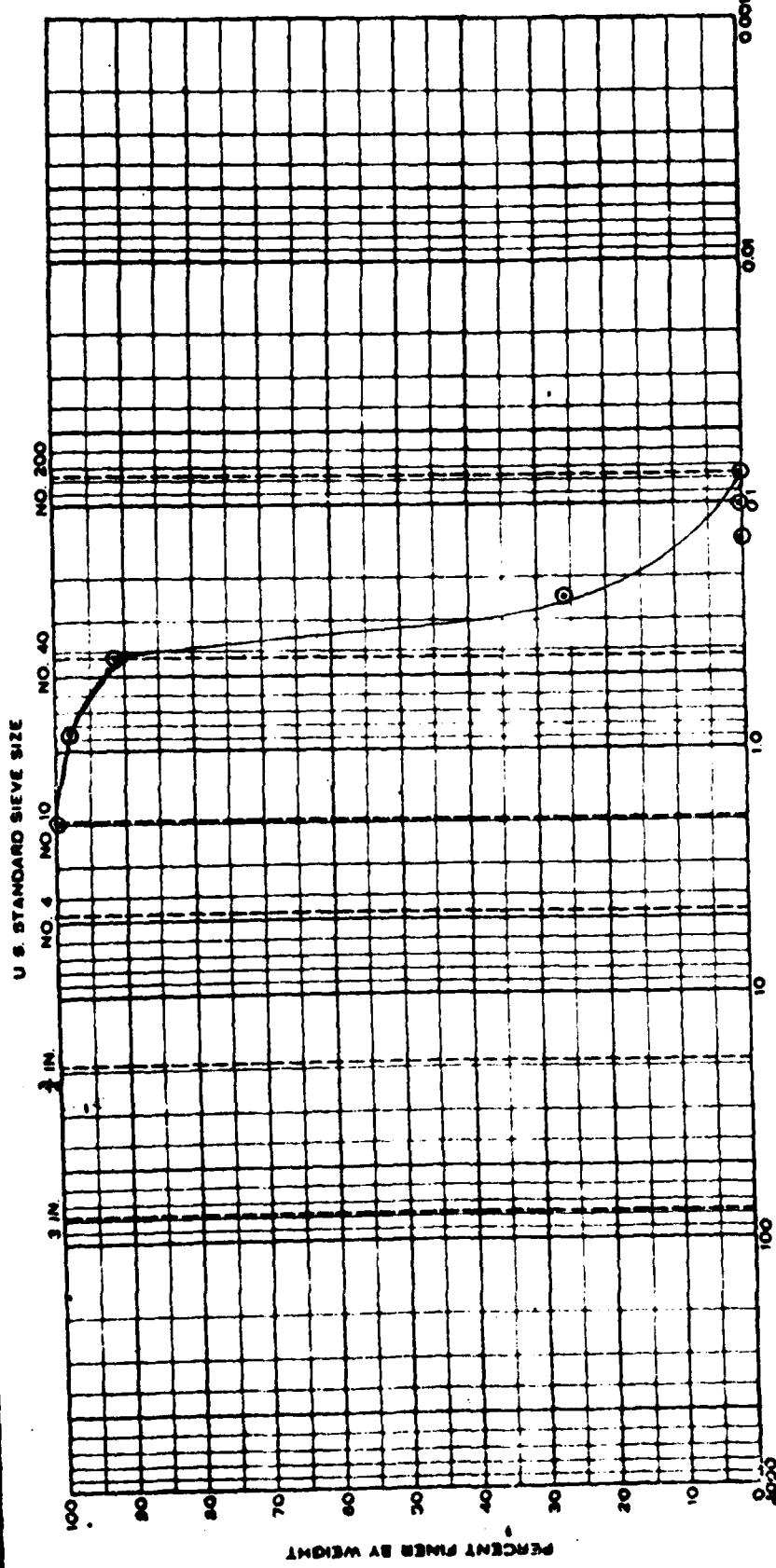


AB11

GRADATION CURVES

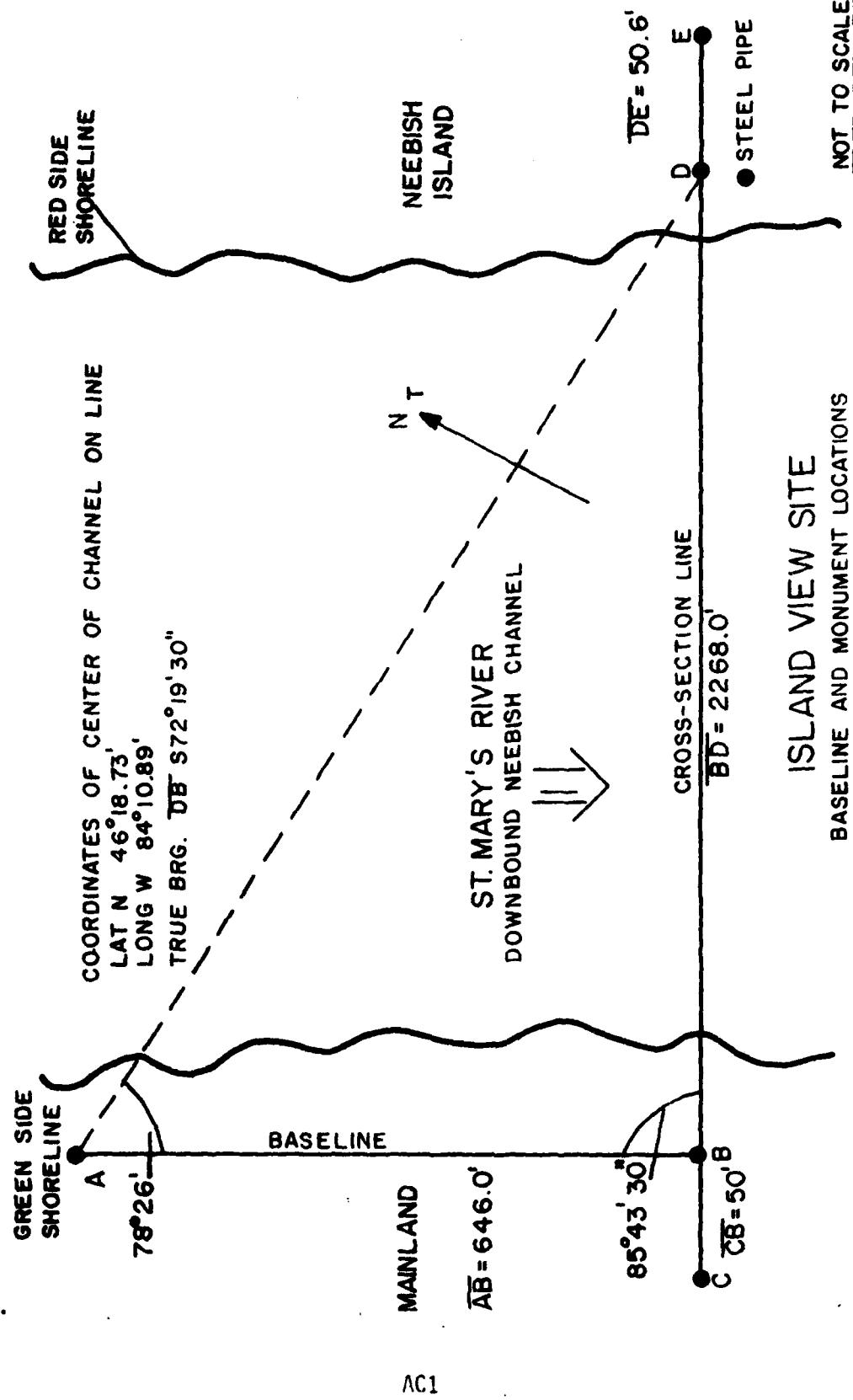


AB12



GRADATION CURVES	
Sample No.	Elev or Depth
	Classification
	NaIWC
	LL
	PL
	PI
	P-200 = 0.2%
	SP
Area Sand Island, Red Side	
Boring No. Trap Facing Shore	
Date C.M. Beeghly 6/25/85	

ISLAND VIEW



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SOUNDING DATA

NAME OF SECTION ISLAND VIEW
oooooooooooooooooooooo

DATE OF SOUNDING NOVEMBER 2, 1984

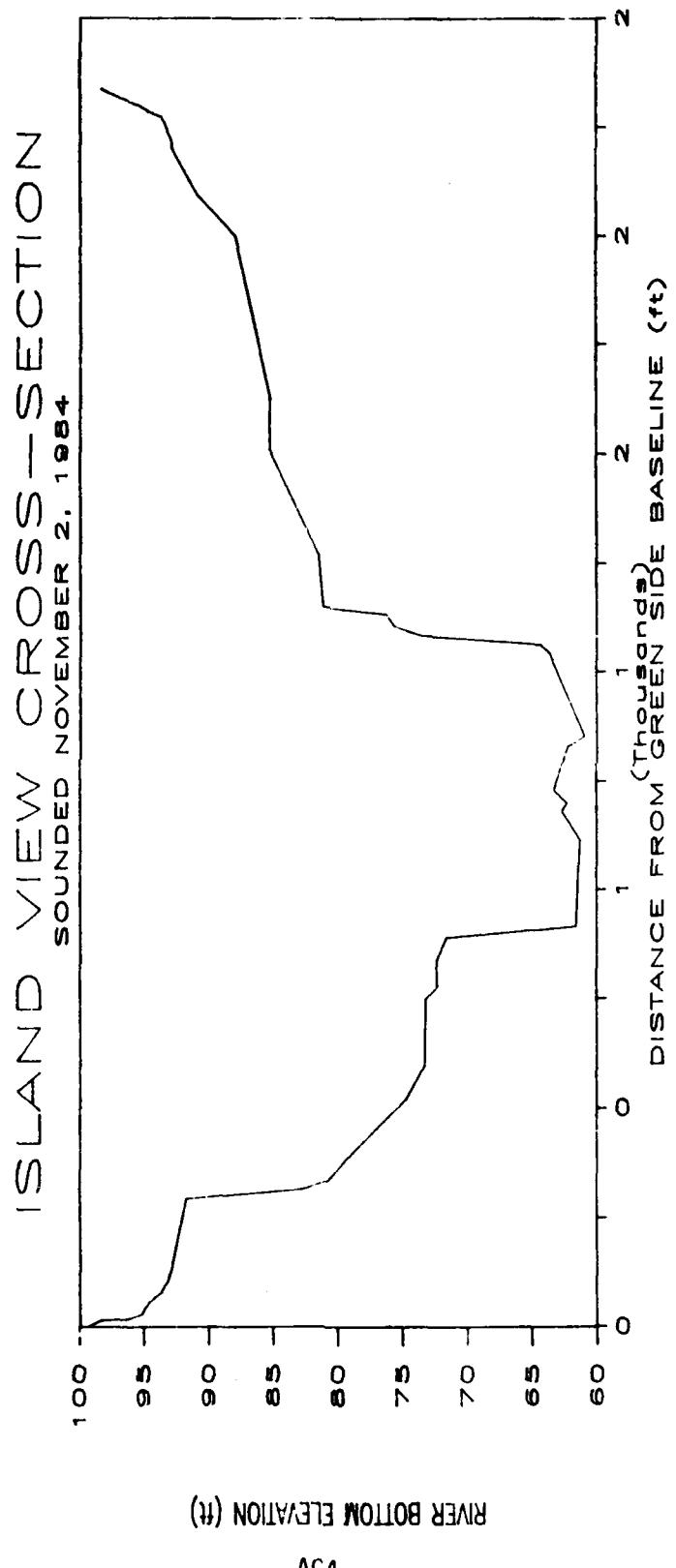
WATER SURFACE ELEVATION in feet = 96.31

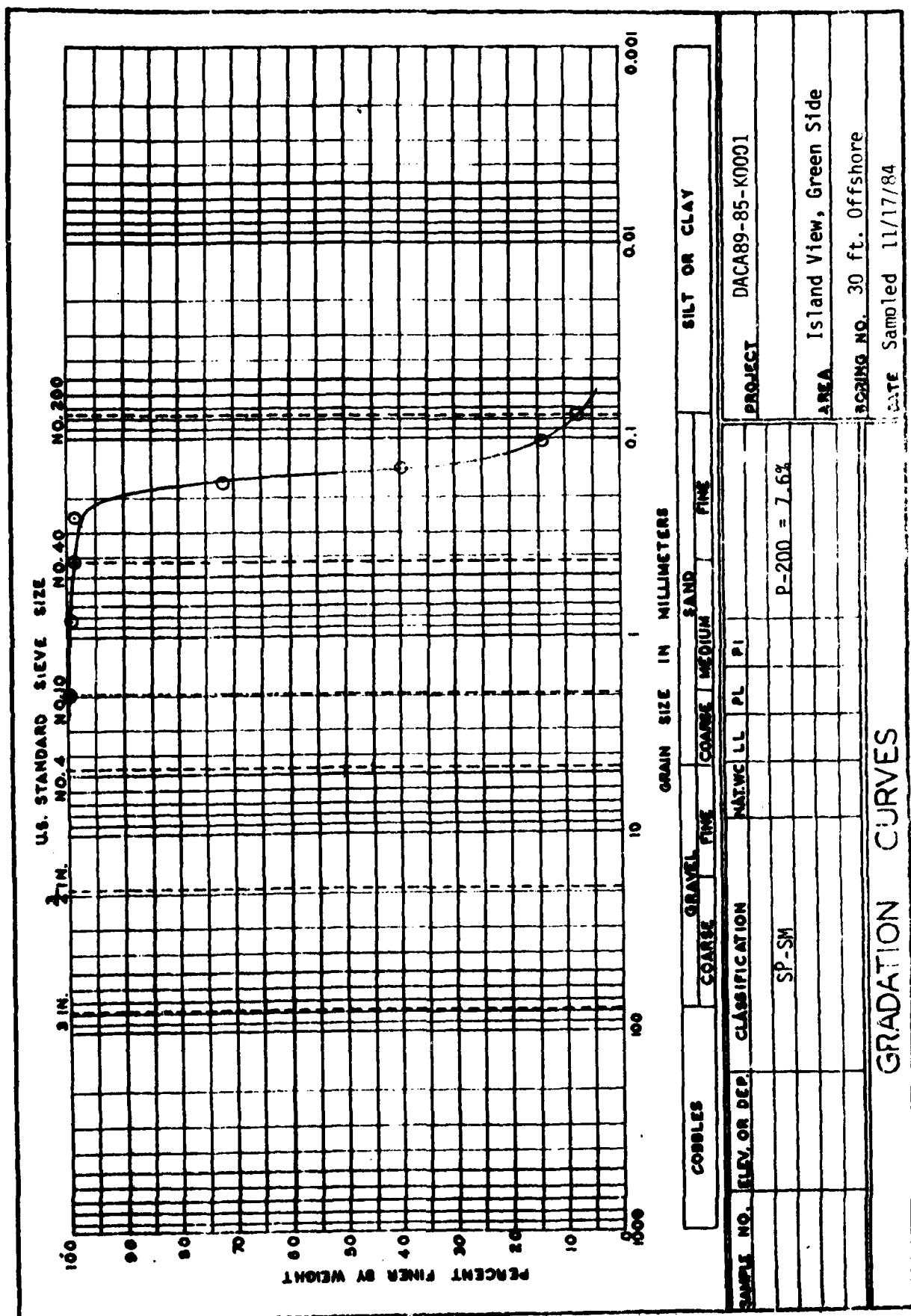
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
B	0.0	99.3
2	12.0	98.3
3	14.0	97.3
4	15.2	96.3
5	25.0	95.1
6	35.0	94.9
7	45.0	94.6
8	55.0	94.1
9	65.0	93.6
10	75.0	93.4
11	85.0	93.1
12	95.0	93.0
13	236.0	91.7
14	254.0	82.7
15	270.0	80.7
16	305.0	79.5
17	418.0	74.7
18	478.0	73.3
19	599.0	73.2
20	622.0	72.3
21	668.0	72.4
22	712.0	71.6
23	733.0	61.6
24	891.0	61.3
25	944.0	62.7
26	959.0	62.3
27	983.0	63.3
28	1063.0	62.3
29	1083.0	61.0
30	1235.0	63.7
31	1250.0	64.5
32	1267.0	73.6
33	1285.0	75.7
34	1306.0	76.3
35	1320.0	81.2
36	1413.0	81.5
37	1607.0	85.3
38	1703.0	85.3
39	1999.0	88.0
40	2074.0	90.9

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SOUNDING DATA (continued)

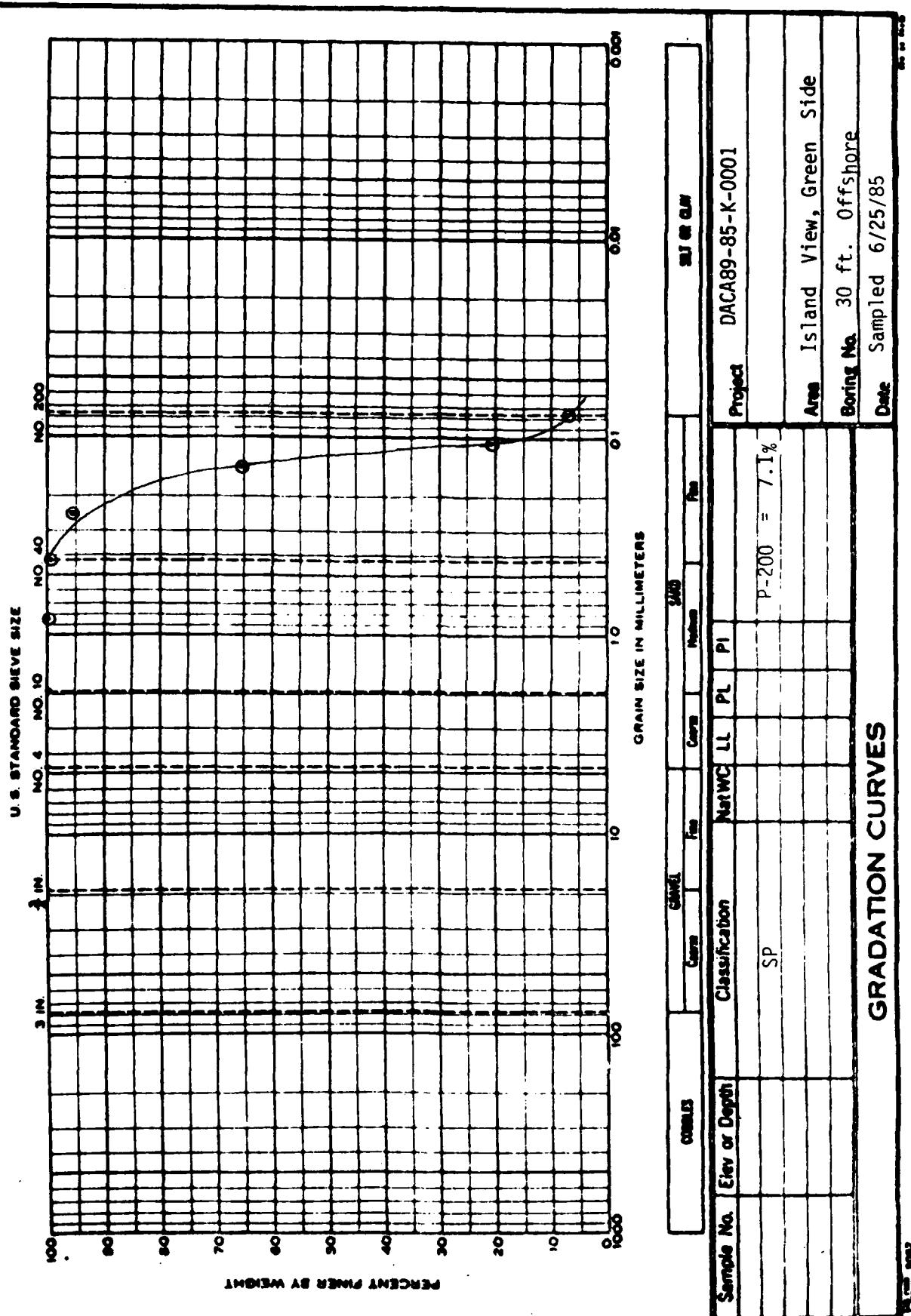
NAME OF SECTION ISLAND VIEW
oooooooooooooooooooooo

DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	2148.0	92.6
42	2158.0	92.8
43	2168.0	92.9
44	2178.0	93.0
45	2188.0	93.2
46	2198.0	93.3
47	2208.0	93.5
48	2218.0	93.7
49	2228.0	94.7
50	2238.0	95.4
51	2247.0	96.3
D	2268.0	98.3

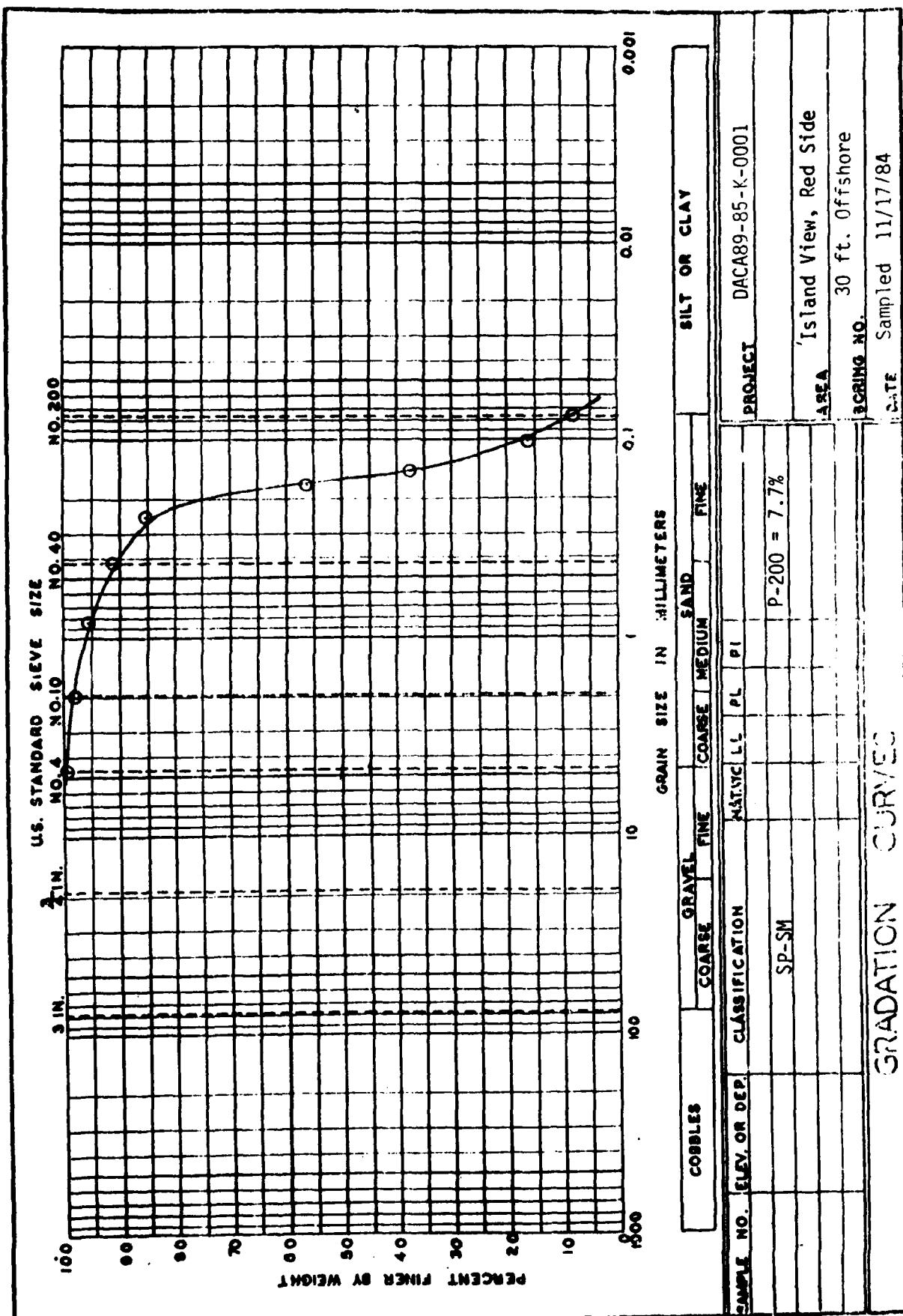




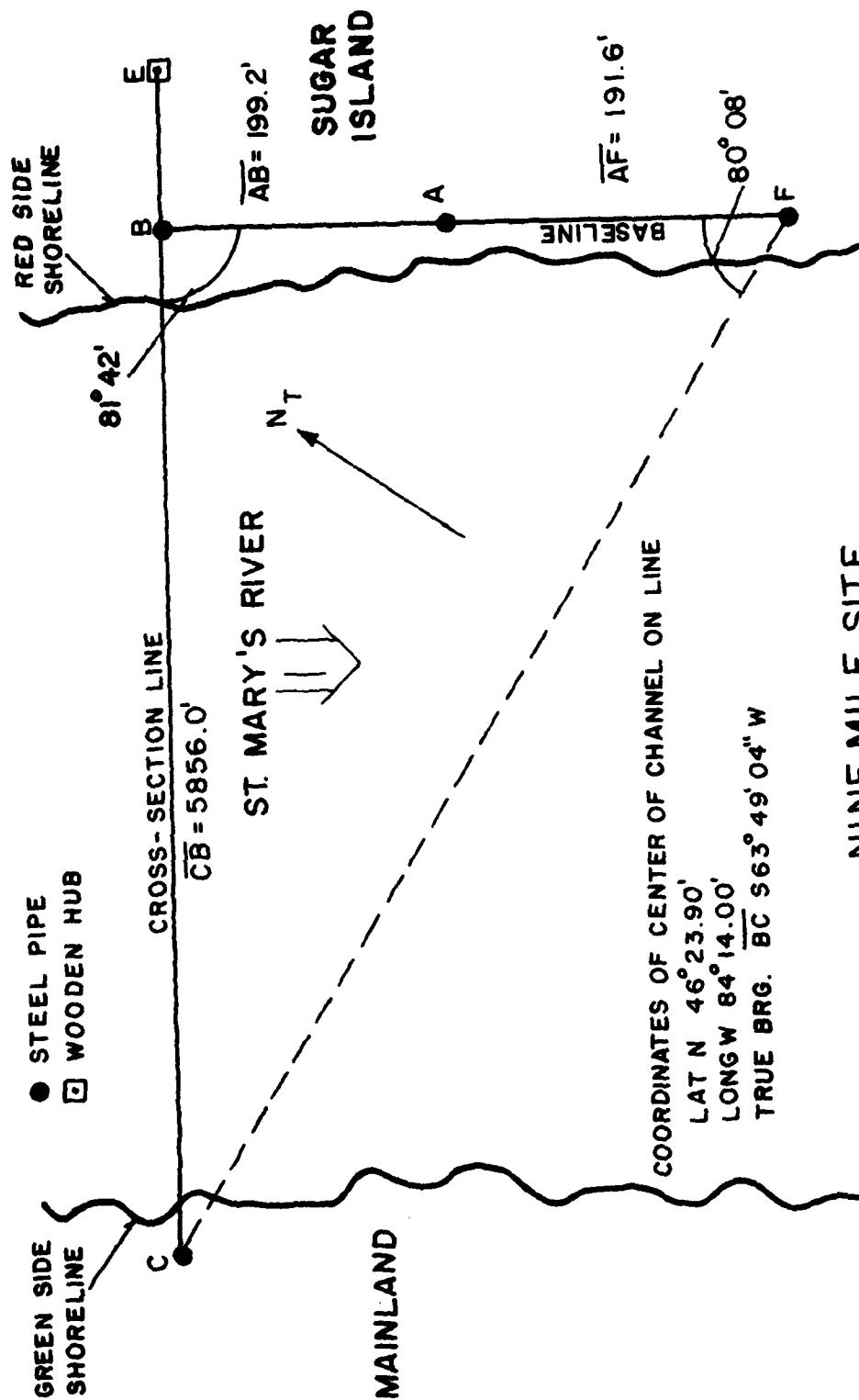
AC5



AC6



NINE MILE



NINE MILE SITE
 BASELINE AND MONUMENT LOCATIONS

NOT TO SCALE

oooooooooooooooooooo
SOUNDING DATA

NAME OF SECTION NINE MILE
oooooooooooo

DATE OF SOUNDING NOVEMBER 6, 1984

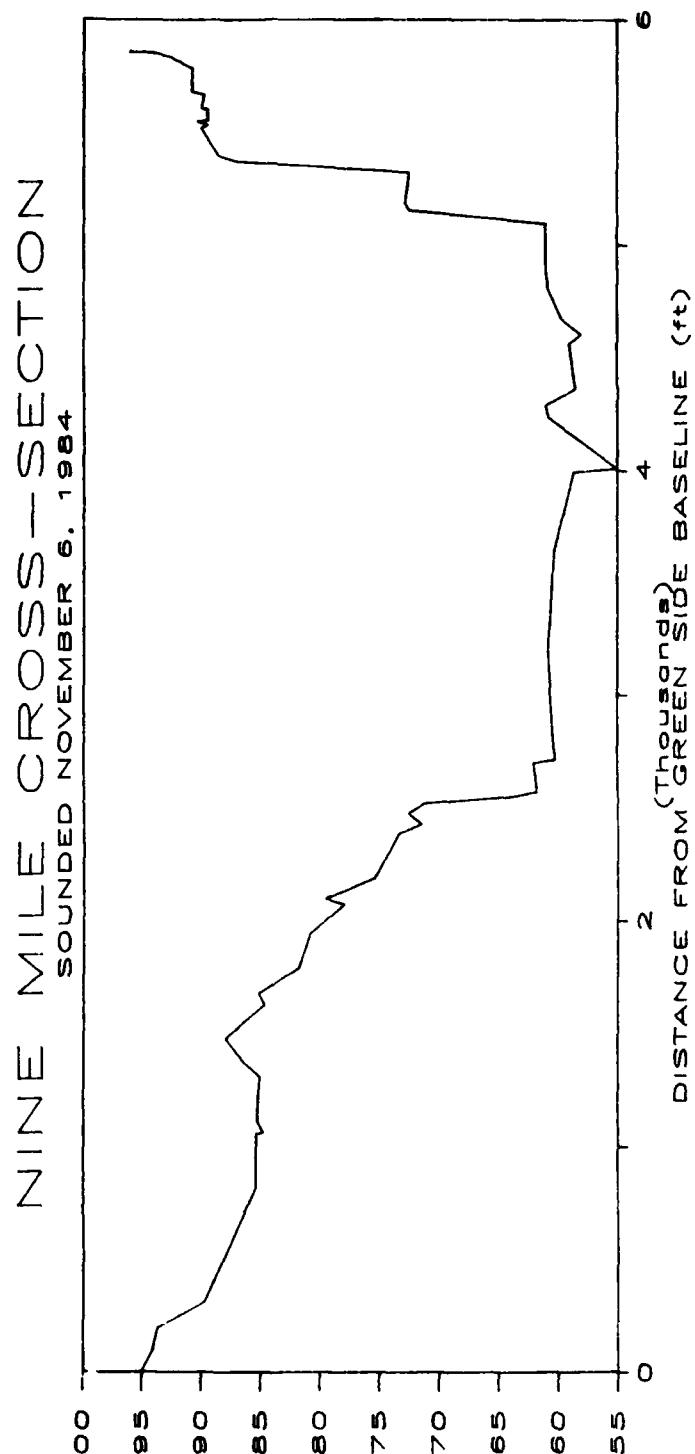
WATER SURFACE ELEVATION in feet = 94.1

DATA POINT	DISTANCE(ft)	ELEVATION(ft)
C	0.0	95.1
2	100.0	94.1
3	200.0	93.6
4	314.0	89.7
5	816.0	85.4
6	1054.0	85.4
7	1059.0	84.8
8	1108.0	85.3
9	1306.0	85.1
10	1371.0	86.5
11	1475.0	88.0
12	1547.0	86.5
13	1625.0	84.7
14	1673.0	85.2
15	1785.0	81.8
16	1939.0	80.8
17	2067.0	78.0
18	2092.0	79.6
19	2185.0	75.4
20	2384.0	73.4
21	2428.0	71.5
22	2473.0	72.6
23	2519.0	71.2
24	2547.0	64.1
25	2570.0	61.8
26	2701.0	62.1
27	2714.0	60.2
28	2798.0	60.5
29	3174.0	60.9
30	3644.0	60.3
31	3993.0	58.7
32	4008.0	55.1
33	4236.0	60.9
34	4287.0	61.1
35	4363.0	58.6
36	4562.0	59.1
37	4604.0	58.1
38	4676.0	59.8
39	4807.0	60.9
40	4878.0	61.1

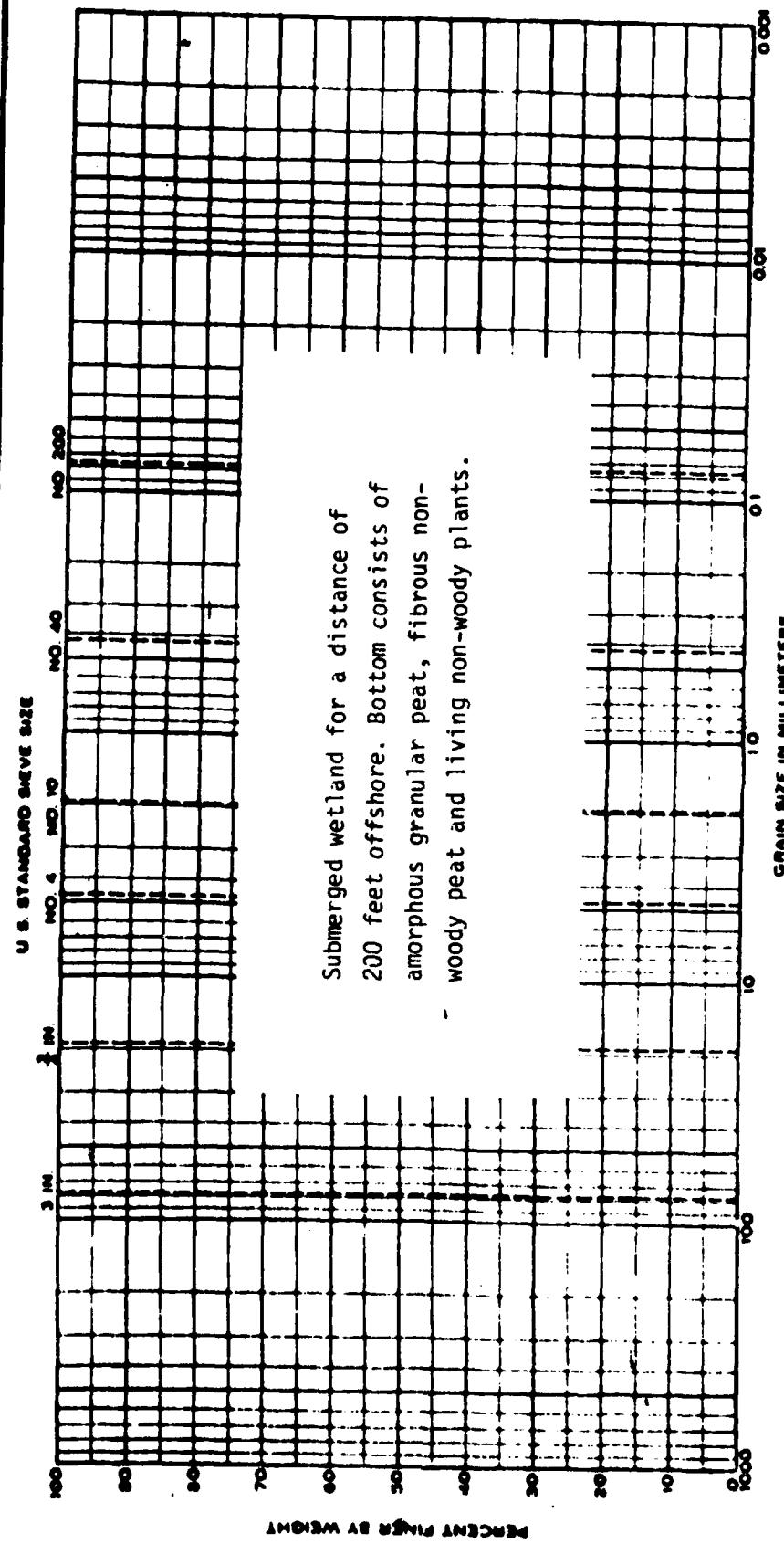
oooooooooooooooooooo
SOUNDING DATA (continued)

NAME OF SECTION NINE MILE
oooooooooooooooooooo

DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	5094.0	61.1
42	5153.0	72.6
43	5184.0	72.9
44	5319.0	72.5
45	5369.0	87.1
46	5396.0	88.7
47	5517.0	90.1
48	5532.0	89.5
49	5548.0	90.4
50	5549.0	89.5
51	5598.0	89.5
52	5607.0	90.1
53	5666.0	89.8
54	5680.0	90.9
55	5781.0	90.8
56	5791.0	91.2
57	5801.0	91.6
58	5811.0	91.8
59	5821.0	92.3
60	5831.0	92.6
61	5841.0	93.3
62	5849.0	94.1
63	5852.0	94.6
64	5852.5	96.1
B	5856.0	96.1



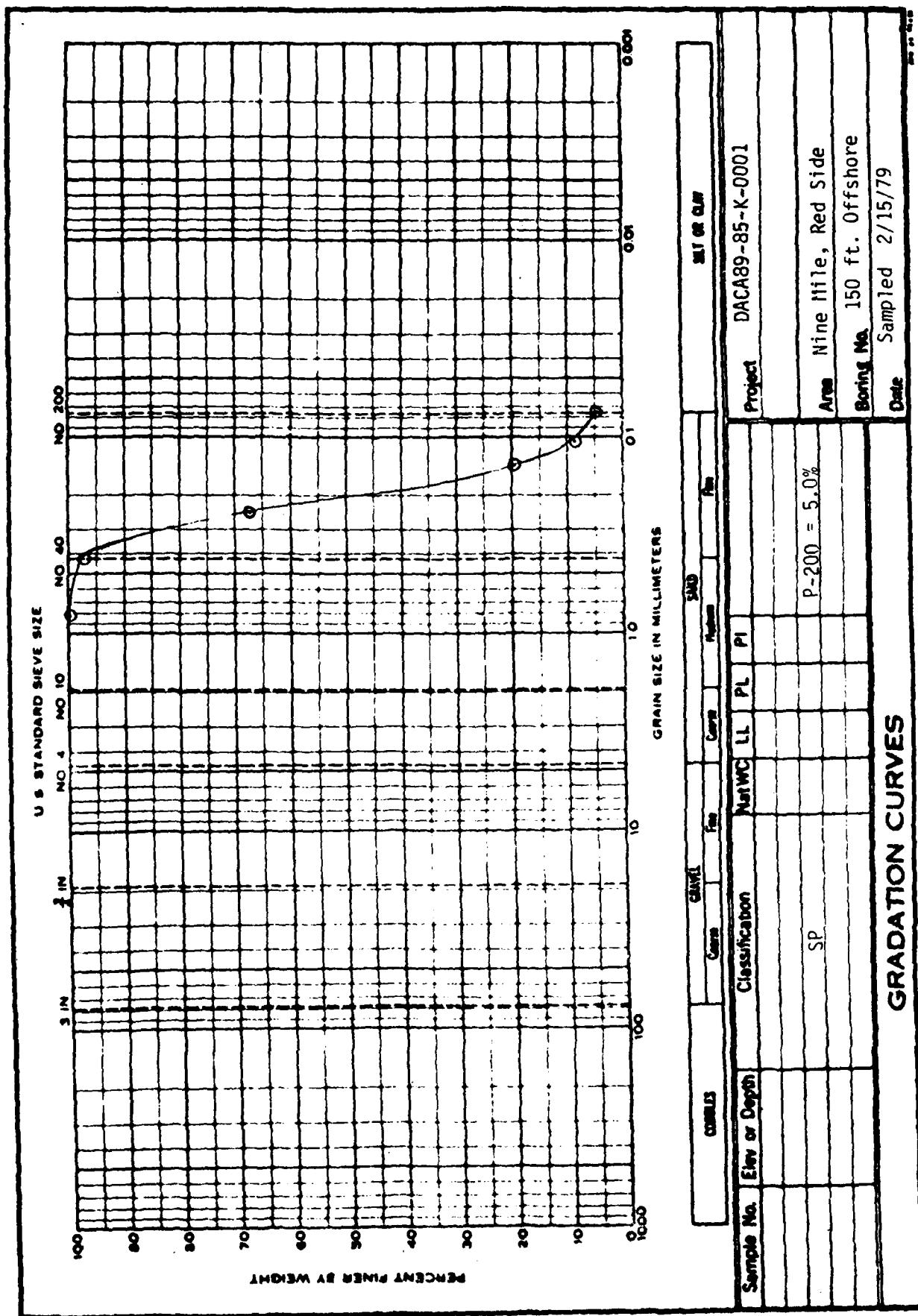
AD4



Submerged wetland for a distance of 200 feet offshore. Bottom consists of amorphous granular peat, fibrous non-woody peat and living non-woody plants.

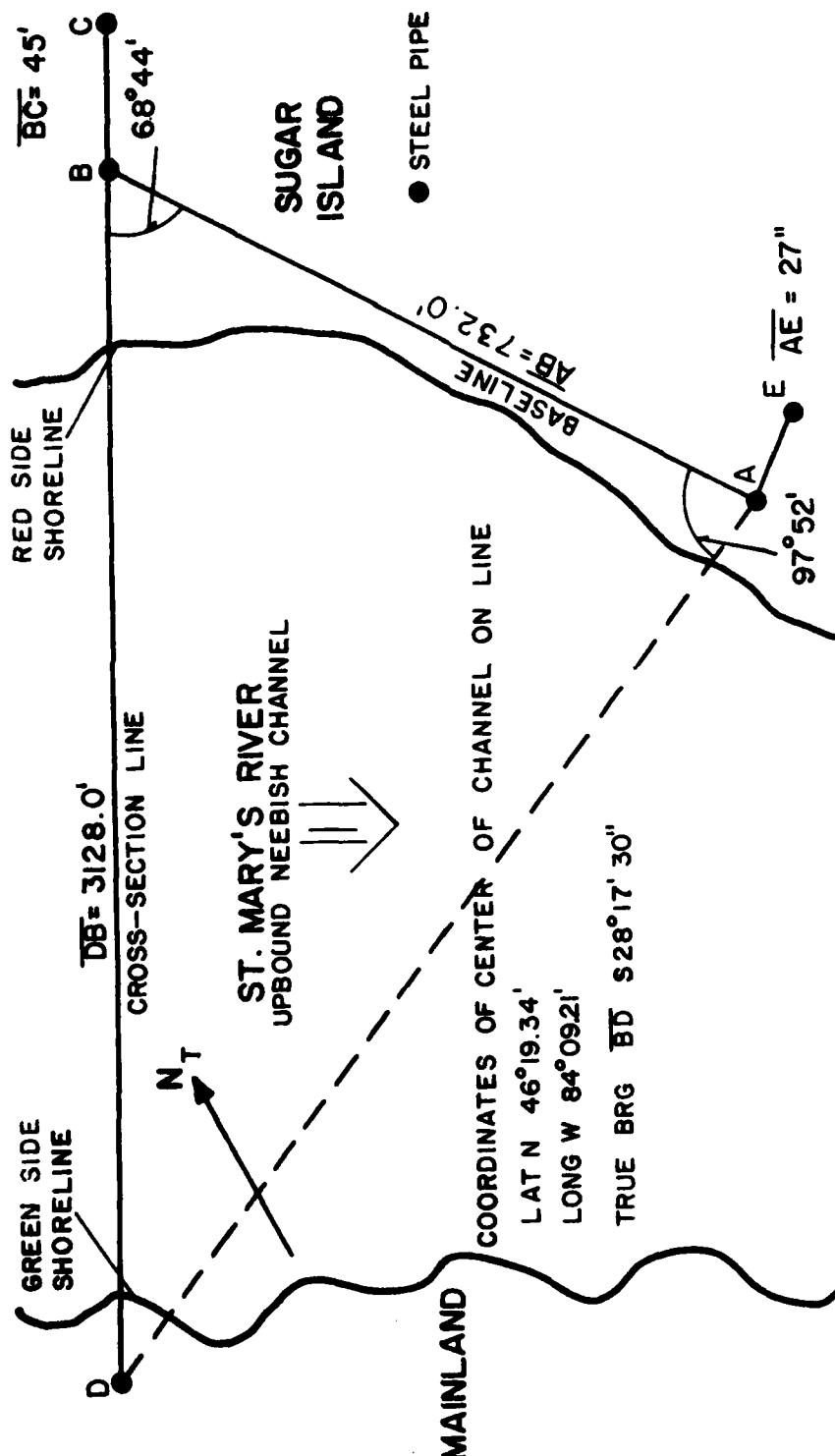
AD5

GRADATION CURVES



AD6

EAST CELL DOCK



EAST CELL DOCK SITE
 BASELINE AND MONUMENT LOCATIONS

NOT TO SCALE

ooooooooooooooooooooo
SOUNDING DATA

NAME OF SECTION EAST CELL DOCK
ooooooooooooooooooooo

DATE OF SOUNDING NOVEMBER 7, 1984

WATER SURFACE ELEVATION in feet = 100.0

DATA POINT	DISTANCE(ft)	ELEVATION(ft)
D	0.0	102.0
2	14.0	100.0
3	20.0	98.9
4	28.0	98.4
5	32.0	97.4
6	35.0	96.4
7	40.0	96.3
8	50.0	96.0
9	65.0	95.4
10	76.0	94.7
11	91.0	94.8
12	97.0	94.3
13	135.0	94.3
14	147.0	94.9
15	165.0	94.7
16	183.0	93.4
17	203.0	92.1
18	257.0	86.0
19	307.0	82.7
20	375.0	79.0
21	381.0	76.4
22	384.0	77.0
23	387.0	76.0
24	394.0	72.5
25	410.0	64.5
26	422.0	64.9
27	429.0	63.6
28	437.0	63.0
29	463.0	63.4
30	469.0	62.3
31	475.0	62.3
32	484.0	63.6
33	486.0	62.0
34	511.0	64.0
35	514.0	63.5
36	525.0	64.6
37	528.0	63.6
38	543.0	63.6
39	558.0	66.0
40	573.0	66.5

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SOUNDING DATA (continued)

NAME OF SECTION EAST CELL DOCK
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DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	583.0	67.5
42	605.0	64.4
43	618.0	64.0
44	639.0	64.2
45	649.0	70.0
46	656.0	72.0
47	662.0	71.1
48	672.0	72.9
49	695.0	71.8
50	744.0	72.2
51	762.0	73.2
52	824.0	72.5
53	830.0	72.9
54	961.0	72.7
55	1001.0	74.6
56	1012.0	74.4
57	1033.0	73.3
58	1048.0	74.3
59	1078.0	74.3
60	1174.0	77.7
61	1197.0	80.6
62	1229.0	81.5
63	1256.0	81.0
64	1297.0	82.1
65	1321.0	81.6
66	1347.0	82.8
67	1372.0	89.5
68	1383.0	91.0
69	1393.0	90.9
70	1400.0	90.5
71	1418.0	92.9
72	1440.0	90.6
73	1473.0	89.1
74	1474.0	89.9
75	1488.0	89.9
76	1501.0	89.2
77	1526.0	89.6
78	1583.0	87.8
79	1617.0	88.8
80	1630.0	88.0
81	1664.0	89.7
82	1690.0	89.4
83	1697.0	88.4
84	1708.0	88.2

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SONDING DATA (continued)

NAME OF SECTION EAST CELL DOCK
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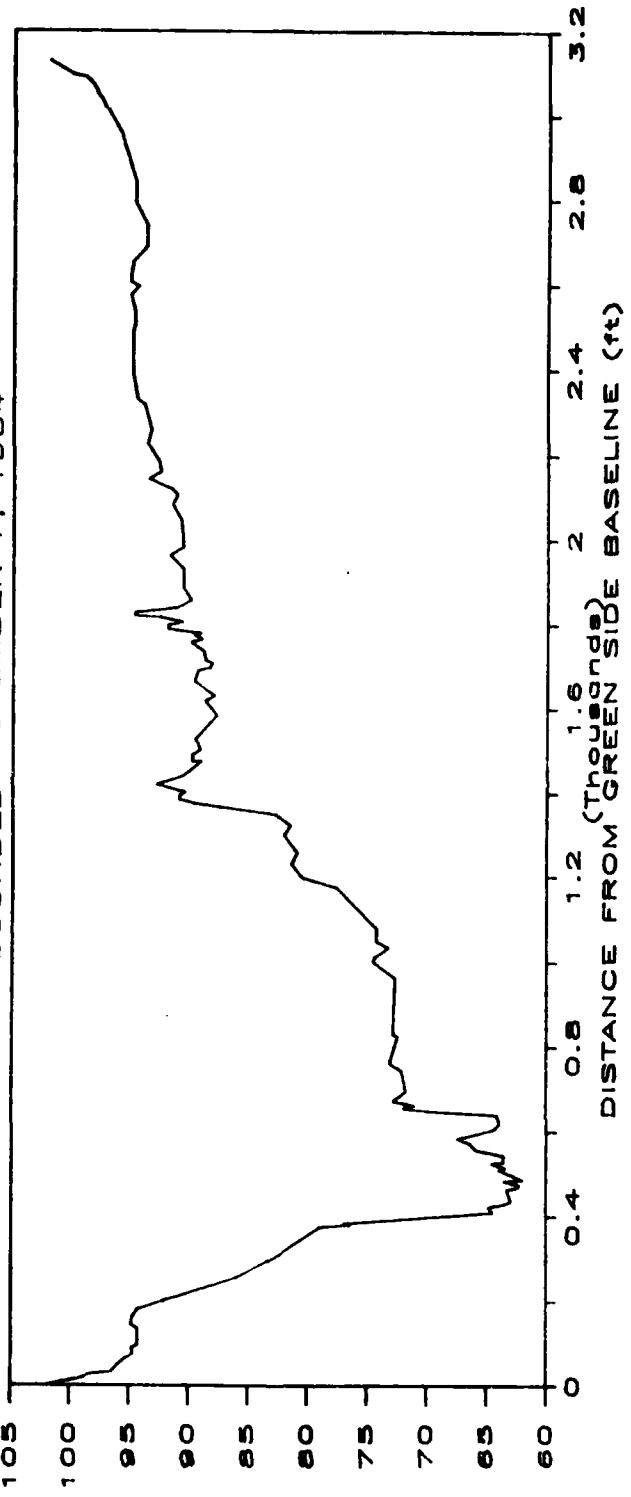
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
85	1714.0	88.8
86	1736.0	89.0
87	1757.0	90.0
88	1765.0	89.1
89	1774.0	89.7
90	1778.0	89.2
91	1781.0	89.8
92	1790.0	92.0
93	1798.0	92.0
94	1805.0	90.7
95	1816.0	92.6
96	1820.0	94.8
97	1828.0	94.7
98	1839.0	91.2
99	1857.0	90.0
100	1887.0	90.7
101	1930.0	90.7
102	1963.0	91.8
103	1981.0	90.7
104	2047.0	90.9
105	2080.0	91.6
106	2105.0	91.2
107	2118.0	91.7
108	2141.0	93.6
109	2157.0	92.6
110	2182.0	92.8
111	2222.0	93.7
112	2254.0	93.4
113	2316.0	94.0
114	2328.0	94.6
115	2388.0	95.0
116	2489.0	95.0
117	2503.0	94.8
118	2531.0	94.8
119	2575.0	95.2
120	2595.0	94.5
121	2605.0	95.2
122	2652.0	95.0
123	2689.0	93.8
124	2739.0	93.8
125	2791.0	94.8
126	2842.0	94.8
127	2959.0	96.1
128	2999.0	96.9

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SOUNDING DATA (continued)

NAME OF SECTION EAST CELL DOCK
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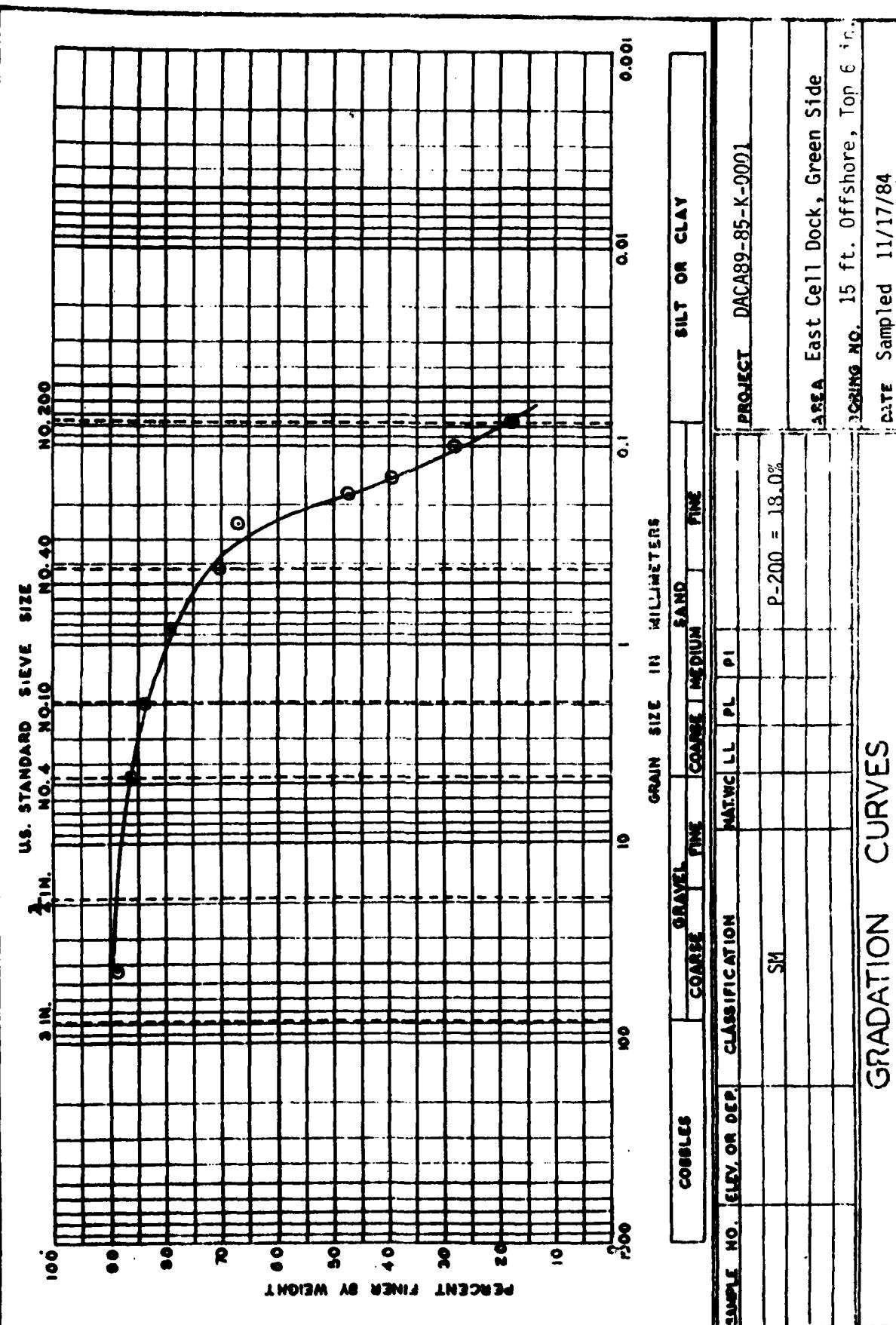
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
129	3009.0	97.1
130	3019.0	97.4
131	3029.0	97.5
132	3039.0	97.7
133	3049.0	98.0
134	3059.0	98.1
135	3069.0	98.3
136	3079.0	98.6
137	3089.0	99.0
138	3095.0	100.0
B	3128.8	102.0

EAST CELL DOCK CROSS-SECTION
SOUNDED NOVEMBER 7, 1984

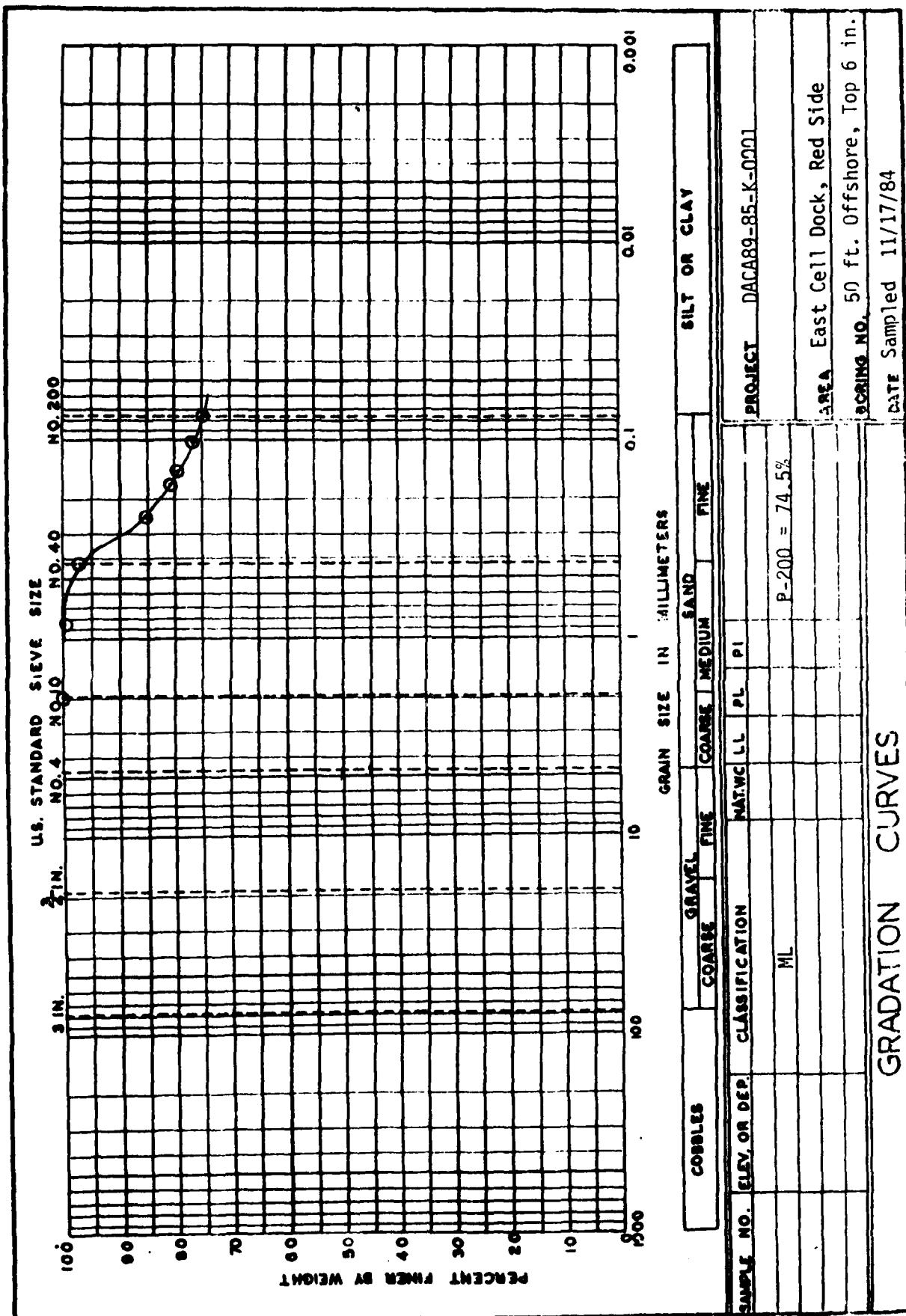


RIVER BOTTOM ELEVATION (ft)

AE6

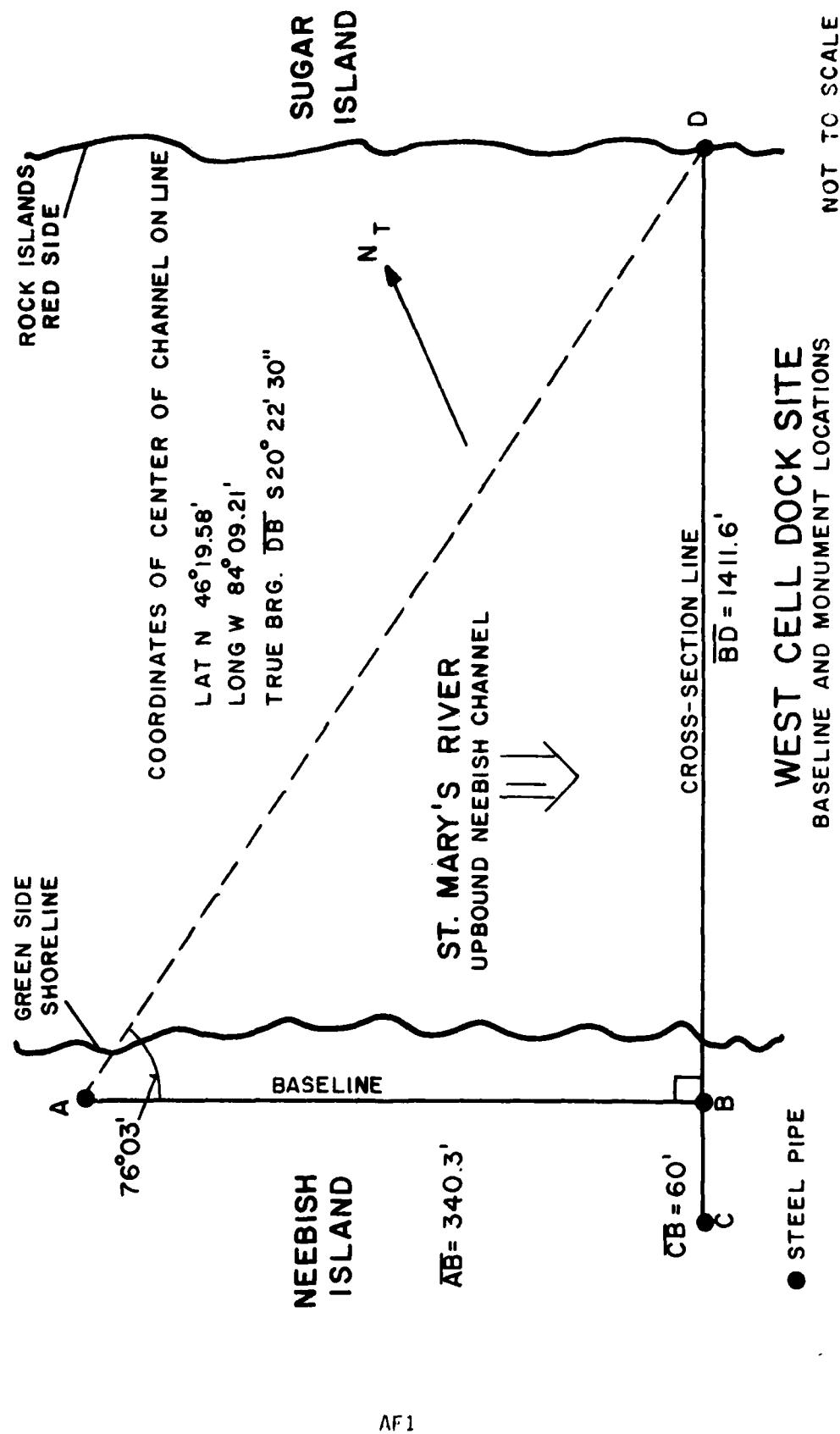


AE7



AE8

WEST CELL DOCK



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SOUNDING DATA

NAME OF SECTION WEST CELL DOCK
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DATE OF SOUNDING NOVEMBER 7, 1984

WATER SURFACE ELEVATION in feet = 100.0

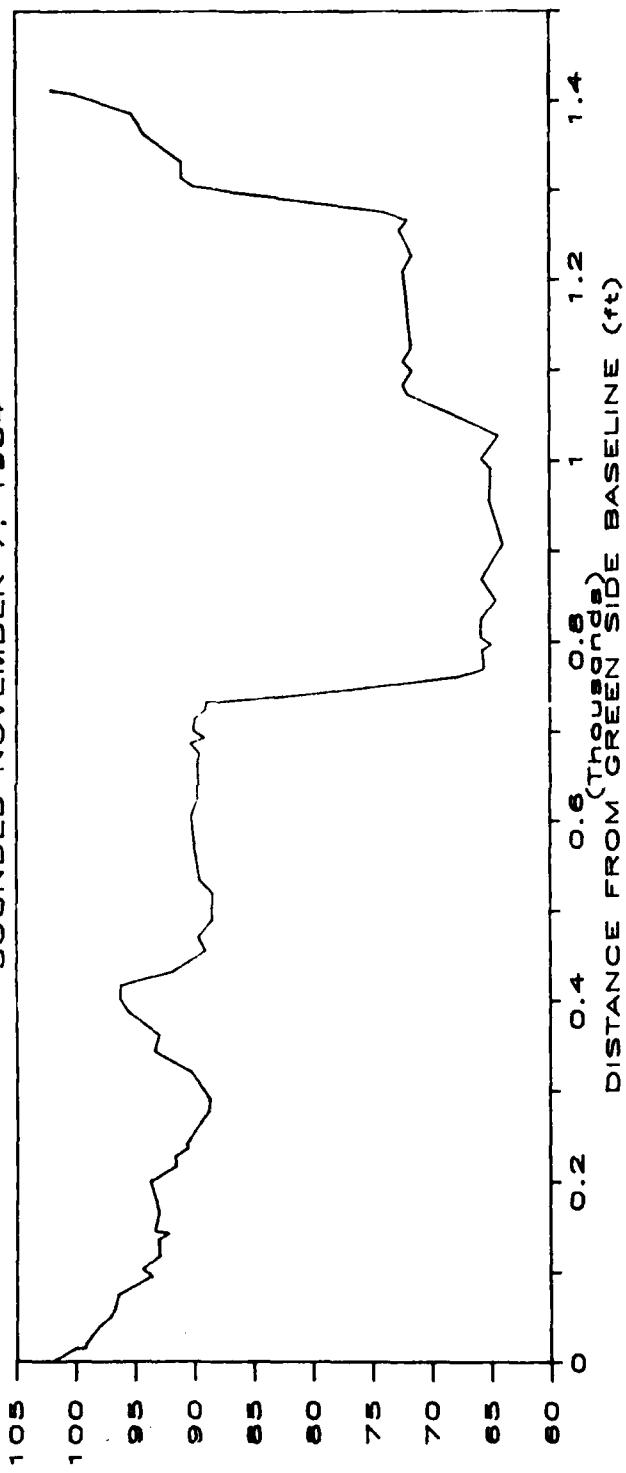
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
8	0.0	102.0
2	15.0	100.0
3	15.5	99.2
4	20.0	99.1
5	30.0	98.6
6	40.0	98.0
7	50.0	97.1
8	60.0	96.7
9	75.0	96.4
10	95.0	93.6
11	103.0	94.4
12	118.0	93.0
13	136.0	93.1
14	143.0	92.2
15	146.0	93.4
16	166.0	93.0
17	200.0	93.8
18	218.0	91.6
19	228.0	91.7
20	238.0	90.6
21	243.0	90.7
22	279.0	88.8
23	292.0	88.7
24	322.0	90.3
25	345.0	93.4
26	363.0	93.0
27	388.0	95.6
28	403.0	96.3
29	418.0	96.2
30	433.0	91.8
31	456.0	89.1
32	471.0	89.7
33	490.0	88.5
34	519.0	88.5
35	535.0	89.6
36	578.0	90.1
37	605.0	90.3
38	625.0	89.7
39	661.0	89.8
40	675.0	89.6

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SOUNDING DATA (continued)

NAME OF SECTION WEST CELL DOCK
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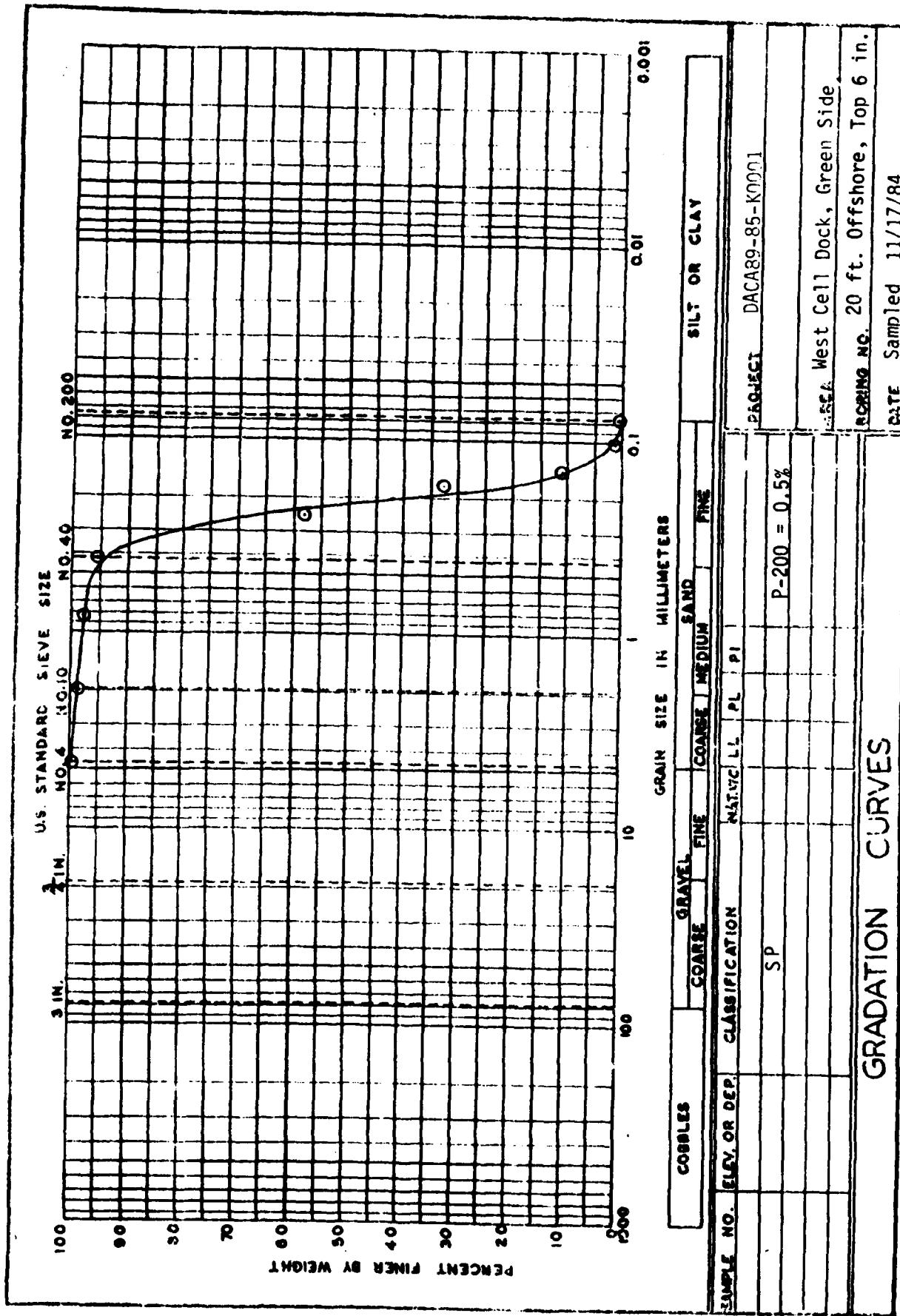
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	687.0	90.4
42	693.0	89.2
43	701.0	90.1
44	714.0	90.0
45	724.0	89.1
46	732.0	89.0
47	743.0	79.0
48	760.0	68.0
49	769.0	65.6
50	790.0	65.8
51	796.0	65.0
52	804.0	65.9
53	825.0	65.8
54	845.0	64.6
55	869.0	65.8
56	907.0	64.0
57	955.0	65.1
58	991.0	65.0
59	1002.0	65.8
60	1028.0	64.3
61	1074.0	72.0
62	1084.0	72.4
63	1099.0	71.6
64	1110.0	72.4
65	1124.0	71.7
66	1210.0	72.4
67	1227.0	71.6
68	1256.0	72.7
69	1267.0	72.0
70	1276.0	74.0
71	1305.0	90.1
72	1315.0	91.1
73	1332.0	91.1
74	1362.0	94.2
75	1386.0	95.3
76	1407.0	100.0
D	1411.6	102.0

WEST CELL DOCK CROSS-SECTION
SOUNDED NOVEMBER 7, 1964

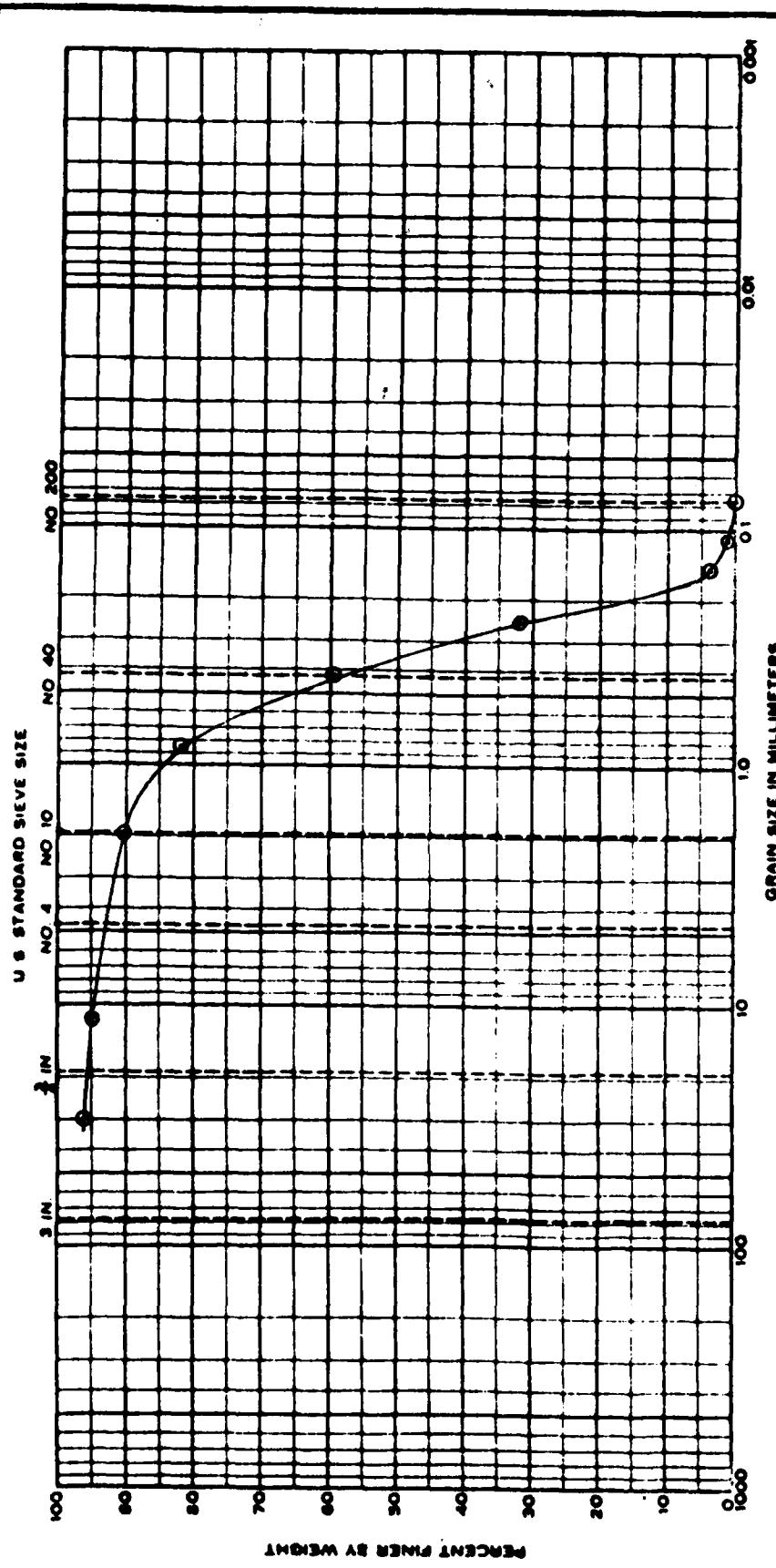


(ft)

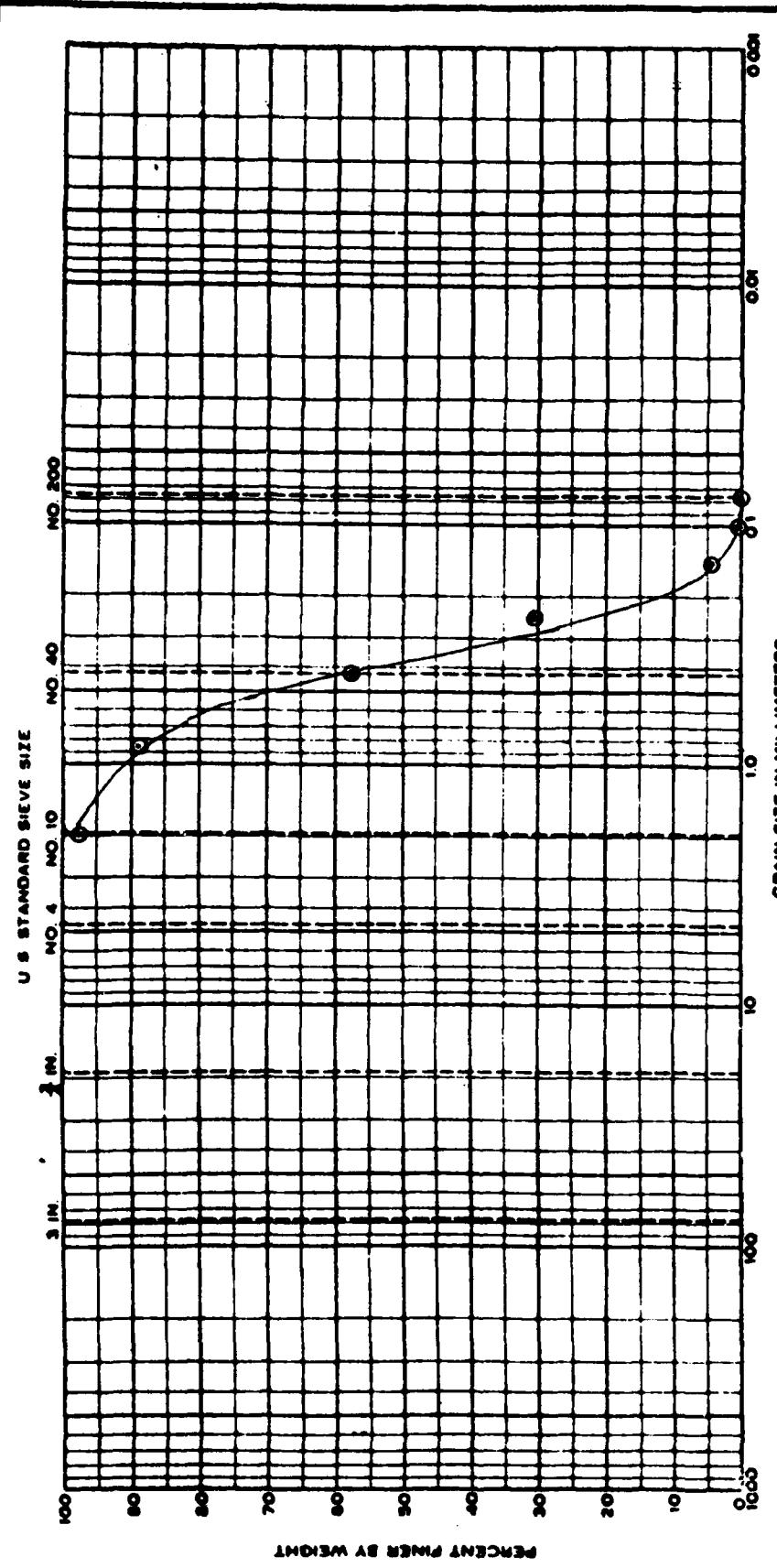
AF4



AF5

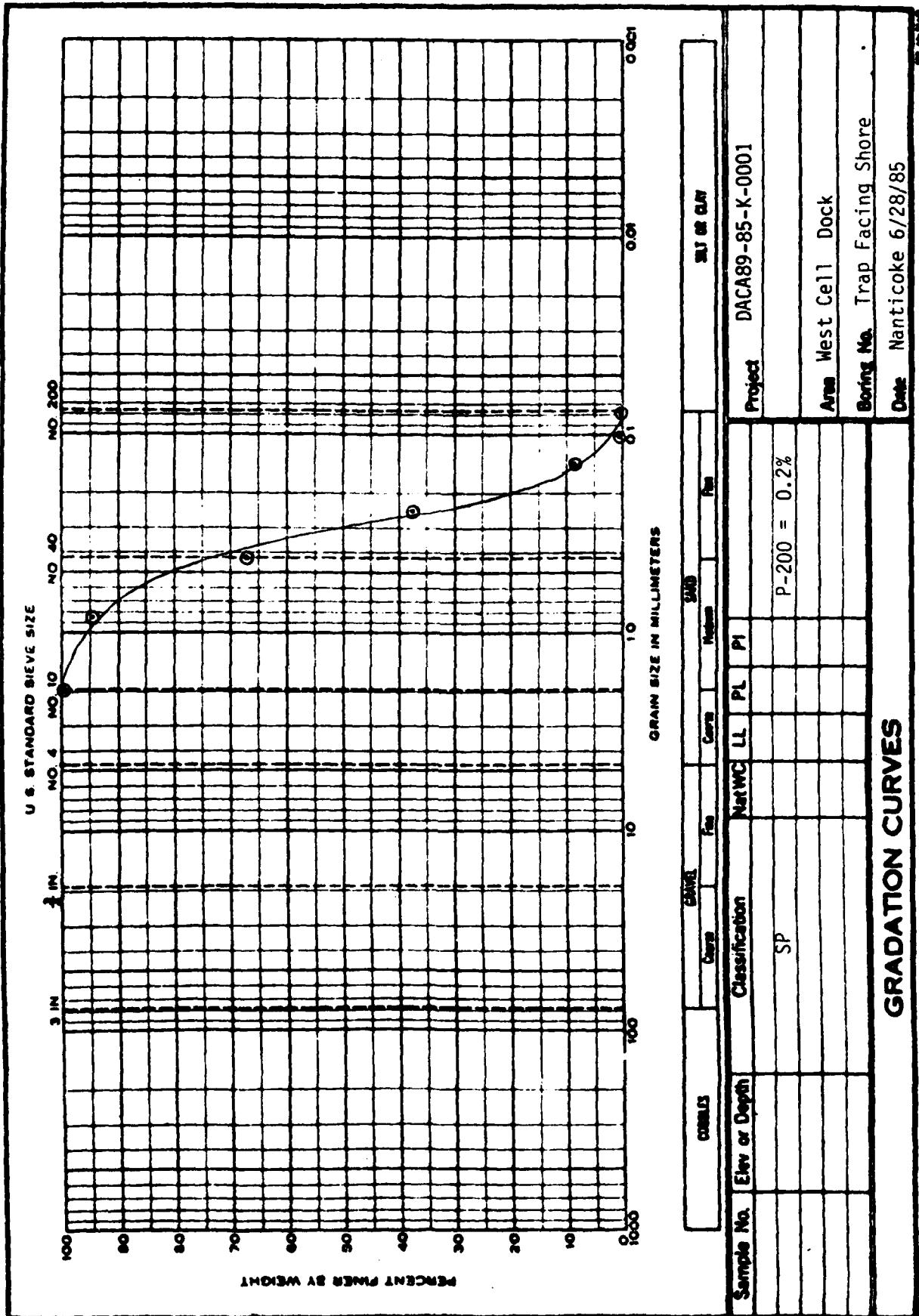


AF6

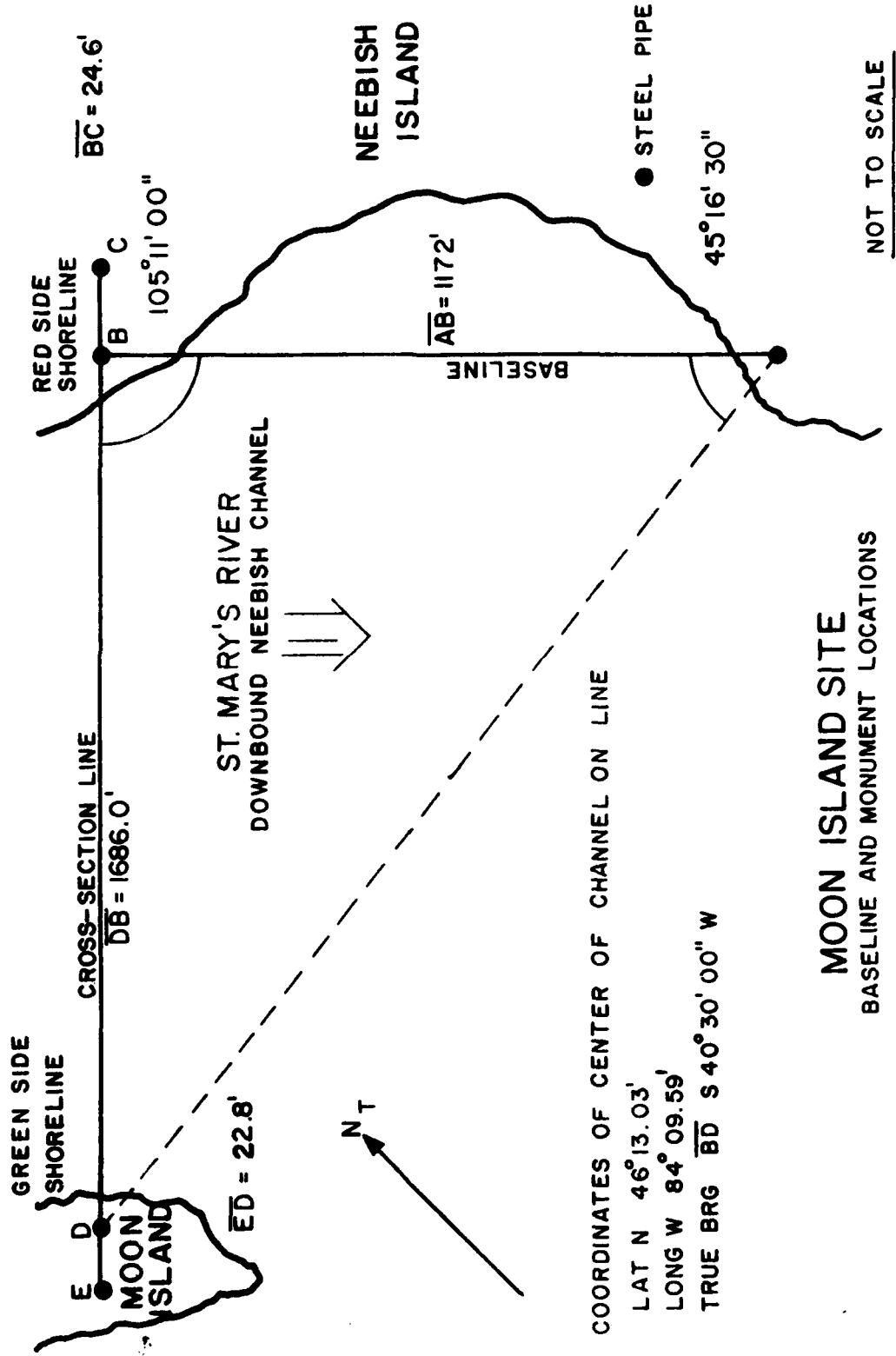


AF7

GRADATION CURVES



MOON ISLAND



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SOUNDING DATA

NAME OF SECTION MOON ISLAND
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DATE OF SOUNDING NOVEMBER 7, 1984

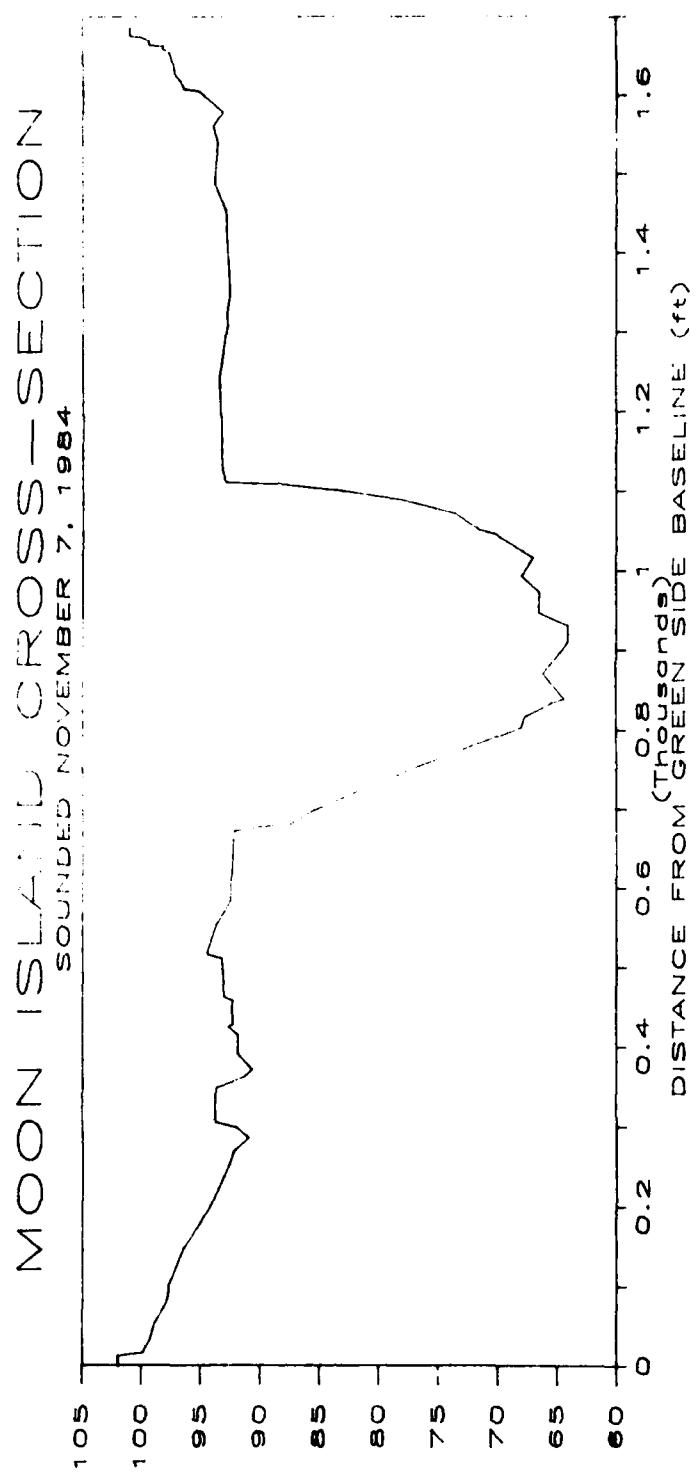
WATER SURFACE ELEVATION in feet = 100.0

DATA POINT	DISTANCE(ft)	ELEVATION(ft)
D	0.0	102.0
2	13.0	102.0
3	17.0	99.8
4	24.0	99.6
5	34.0	99.2
6	44.0	99.0
7	54.0	98.8
8	70.0	98.2
9	83.0	97.8
10	92.0	97.7
11	100.0	97.7
12	148.0	96.4
13	200.0	94.2
14	253.0	92.6
15	270.0	92.2
16	287.0	91.0
17	300.0	92.0
18	307.0	93.8
19	350.0	93.7
20	364.0	91.3
21	373.0	90.7
22	392.0	91.9
23	416.0	91.9
24	426.0	92.7
25	429.0	92.3
26	448.0	92.4
27	459.0	92.3
28	464.0	93.1
29	512.0	93.3
30	517.0	94.5
31	554.0	93.7
32	583.0	92.5
33	672.0	92.2
34	677.0	90.2
35	680.0	87.5
36	697.0	85.6
37	753.0	76.7
38	803.0	68.0
39	816.0	67.7
40	834.0	65.4

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SOUNDING DATA (continued)

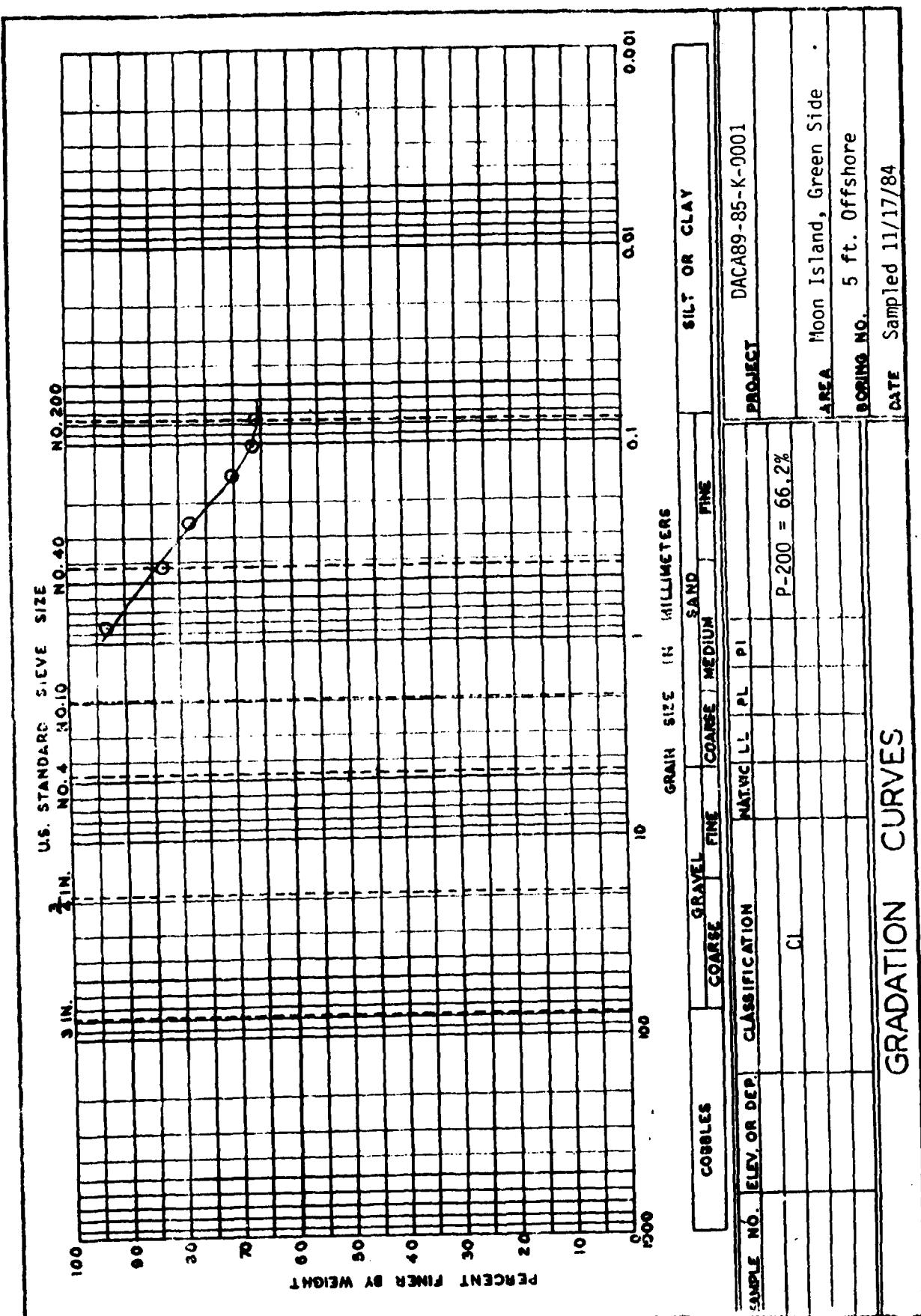
NAME OF SECTION MOON ISLAND
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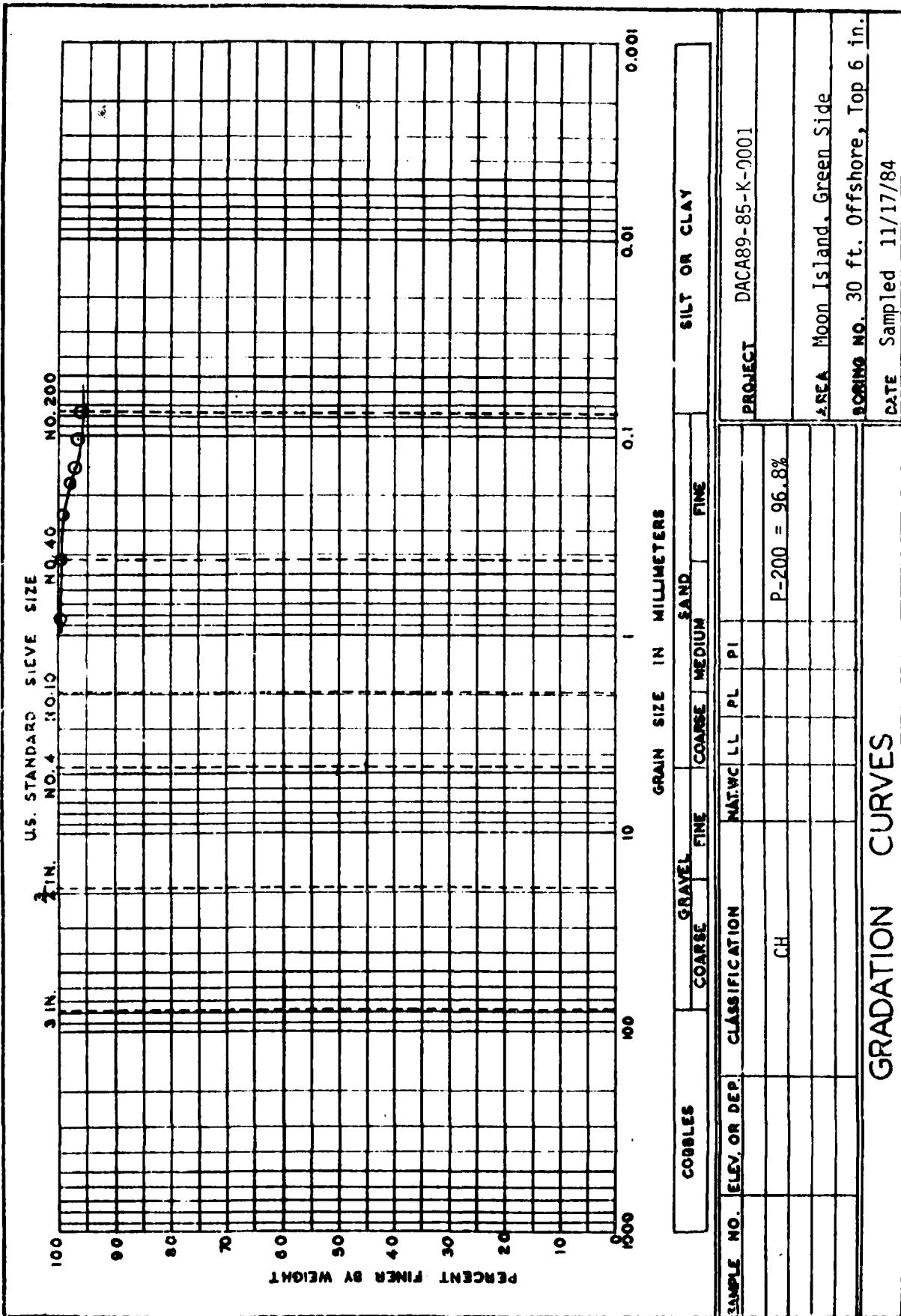
DATA POINT	DISTANCE(ft)	ELEVATION(ft)
41	839.0	64.4
42	871.0	66.2
43	910.0	64.1
44	931.0	64.1
45	948.0	66.6
46	973.0	66.5
47	994.0	68.0
48	1017.0	67.0
49	1046.0	70.2
50	1052.0	71.6
51	1072.0	73.6
52	1090.0	78.0
53	1102.0	83.4
54	1110.0	88.5
55	1113.0	93.0
56	1130.0	93.3
57	1241.0	93.5
58	1311.0	92.8
59	1322.0	92.9
60	1347.0	92.6
61	1454.0	93.0
62	1488.0	93.9
63	1540.0	93.6
64	1561.0	94.0
65	1580.0	93.2
66	1606.0	95.2
67	1609.0	96.5
68	1619.0	96.8
69	1629.0	97.3
70	1639.0	97.4
71	1649.0	97.6
72	1654.0	97.7
73	1659.0	98.2
74	1663.0	98.2
75	1664.0	99.4
76	1669.0	99.4
77	1674.0	100.0
78	1675.0	101.0
B	1686.0	101.0

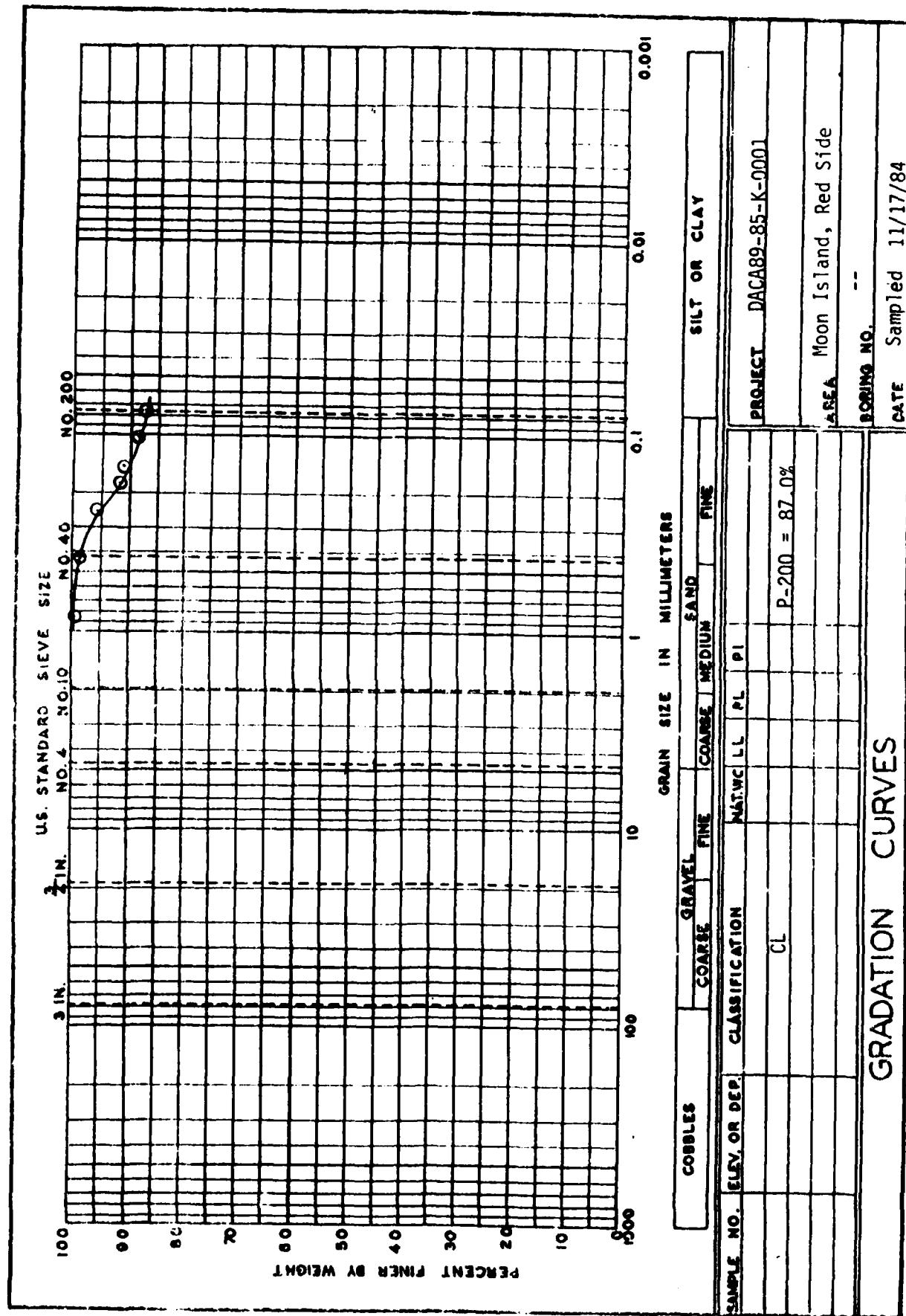


(ft)

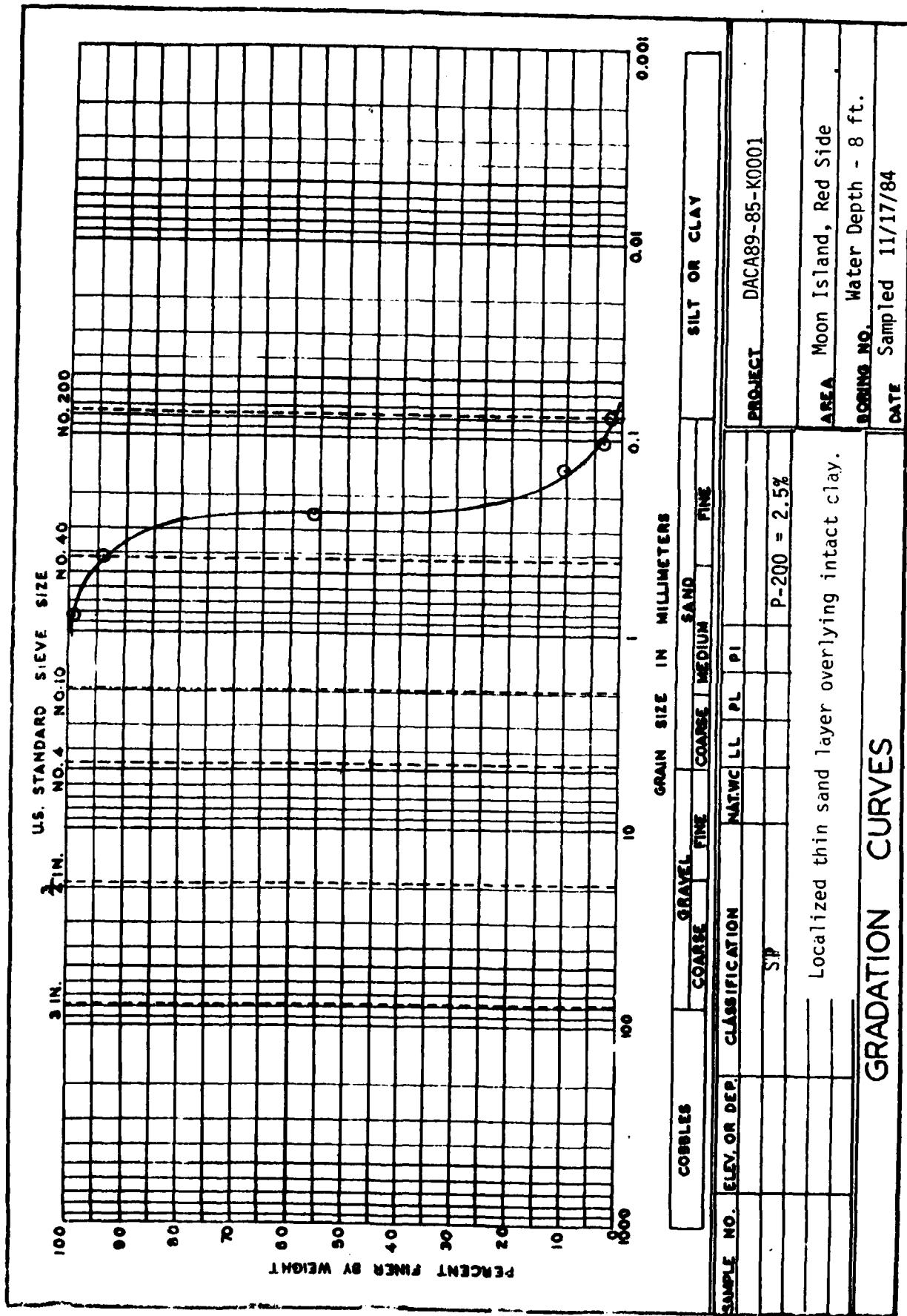
AG4

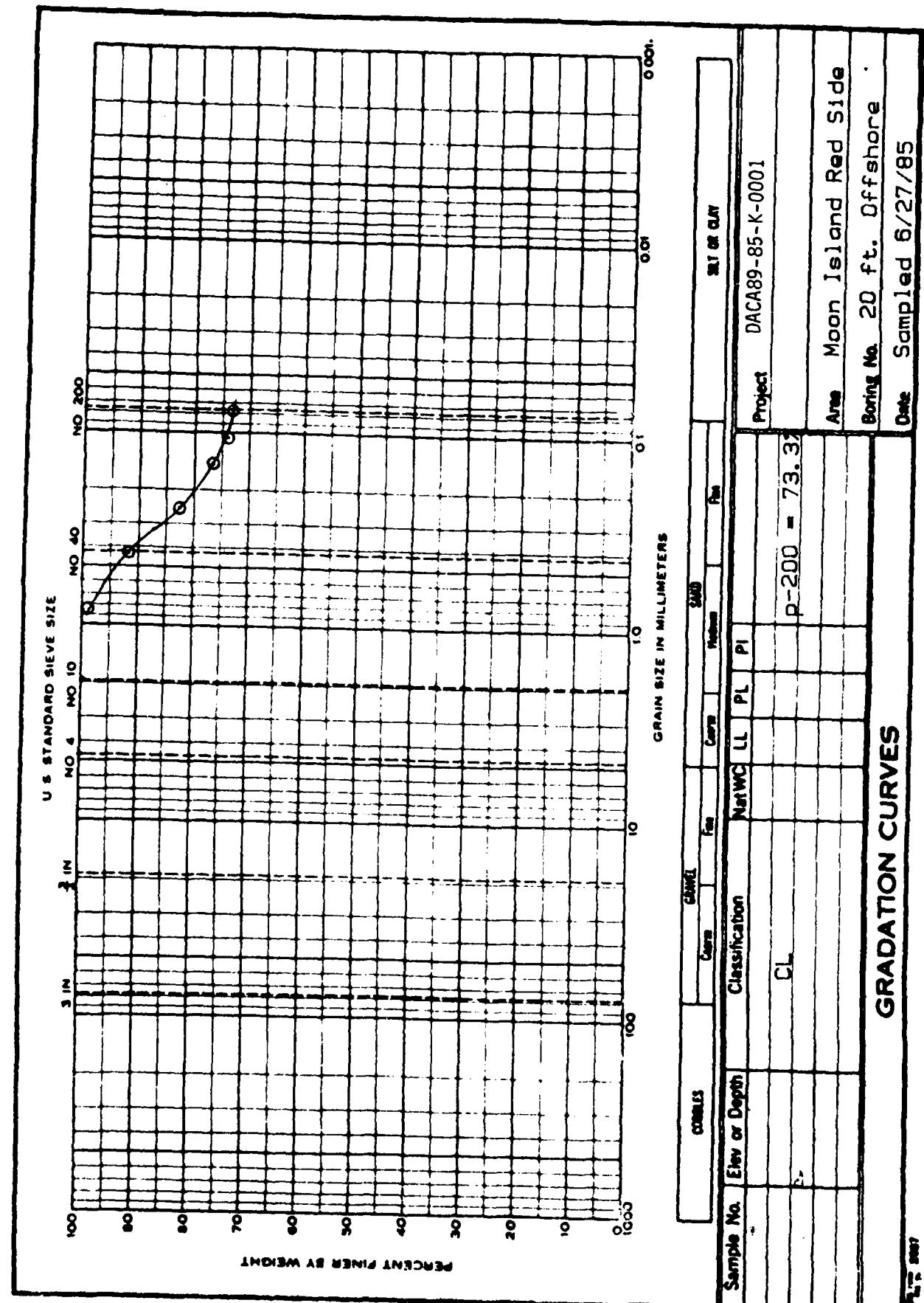






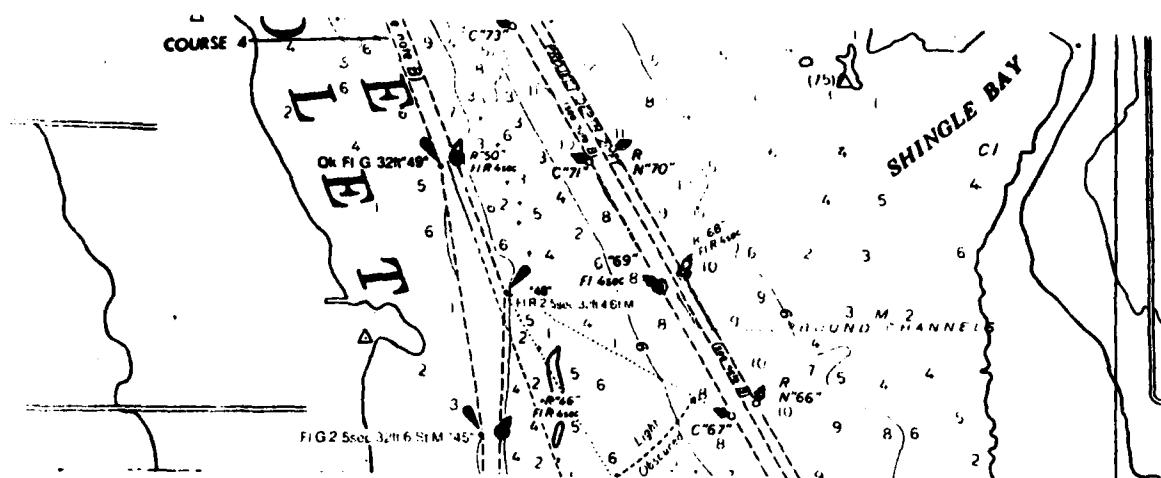
AG7



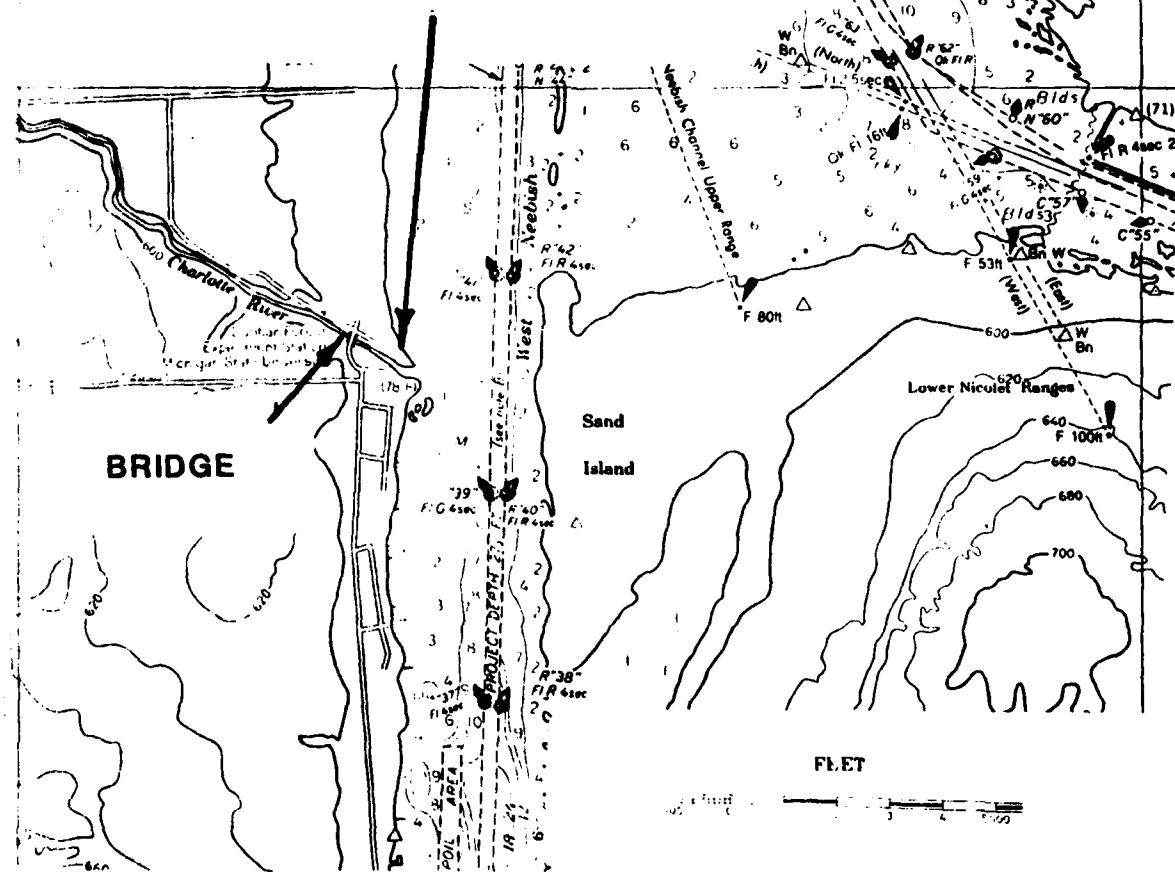


AGG

CHARLOTTE RIVER



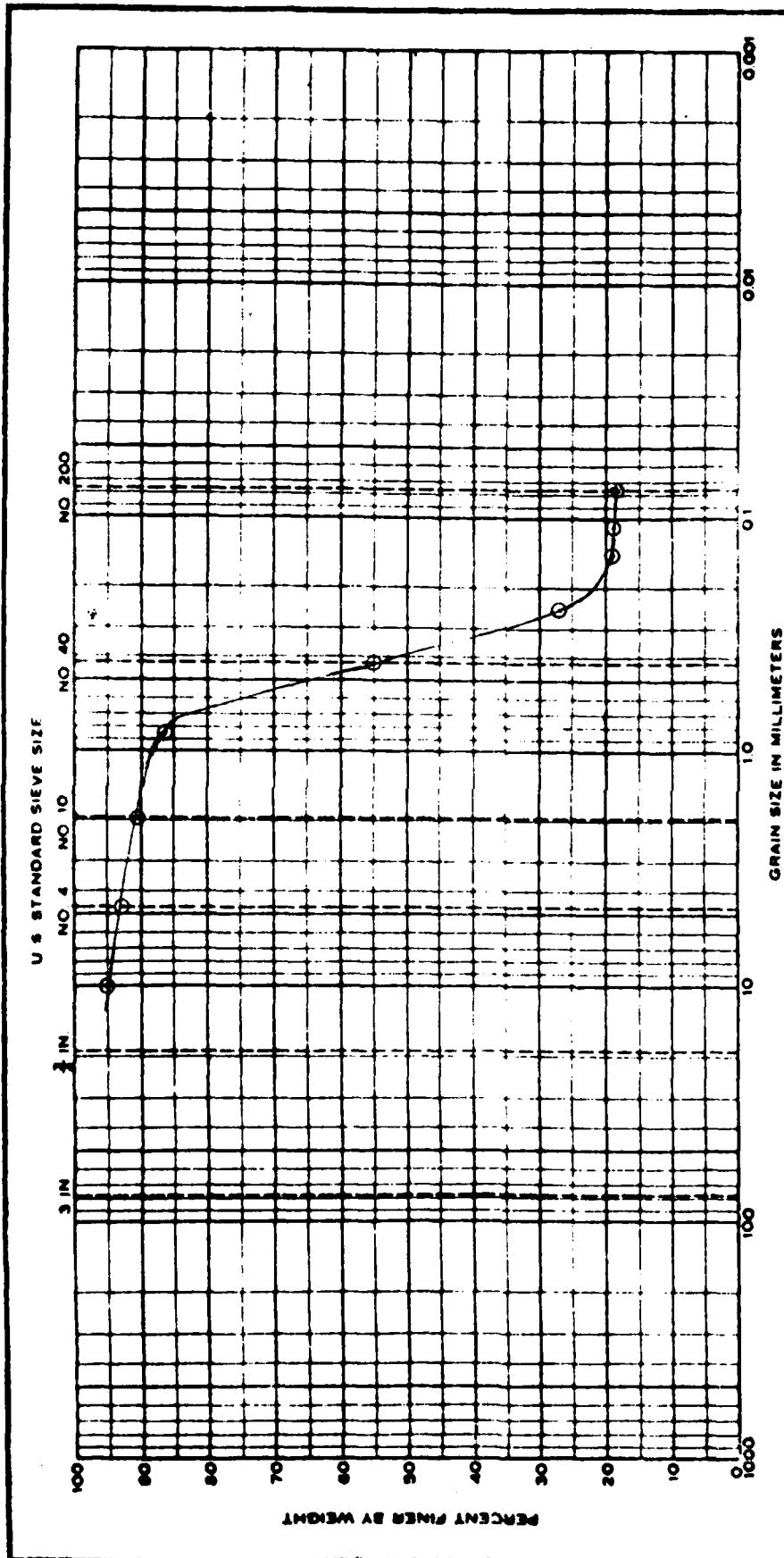
CHARLOTTE RIVER SITE



SITE LOCATION

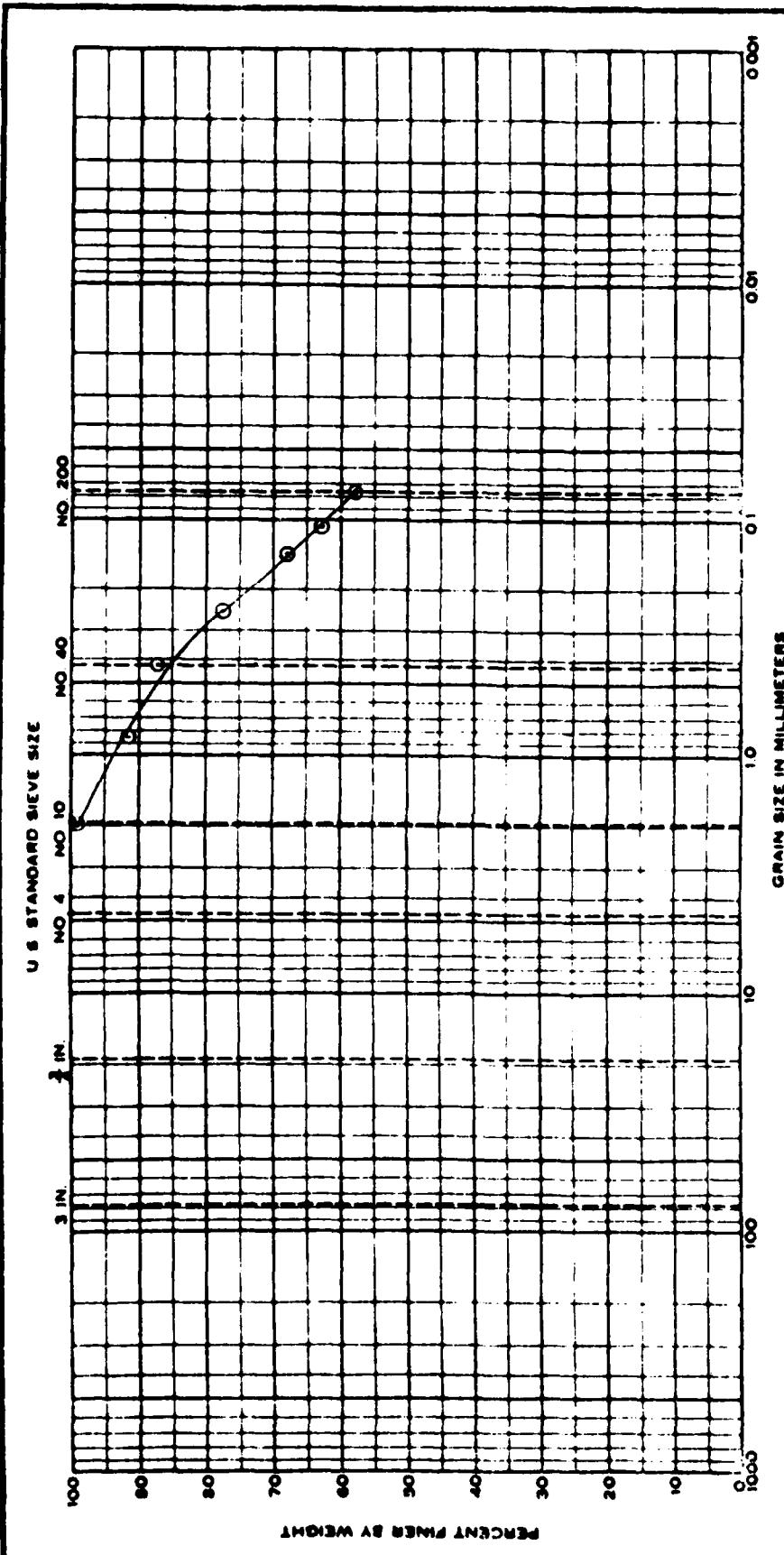
CHARLOTTE RIVER

AH1



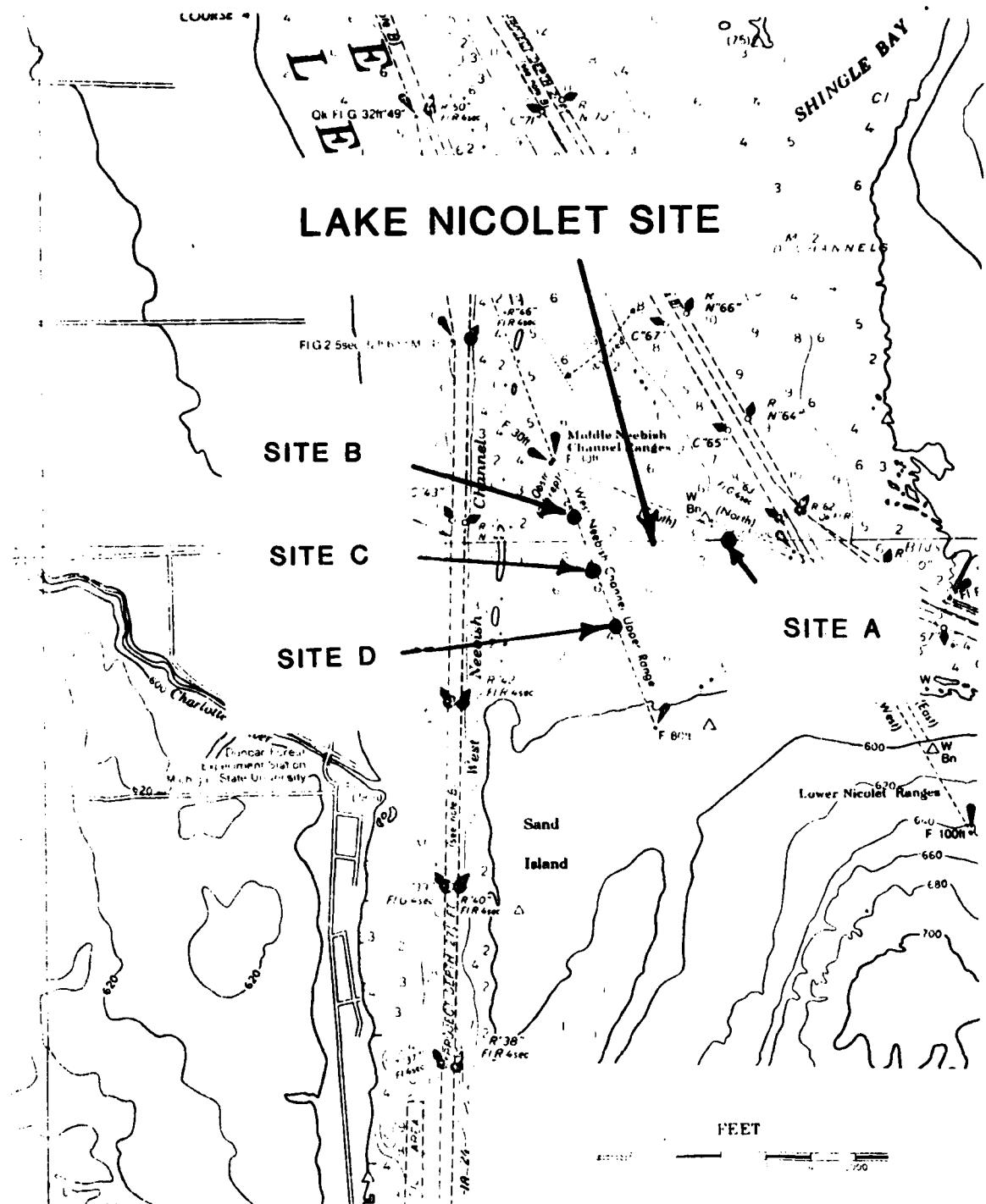
AH?

GRADATION CURVES



AH3

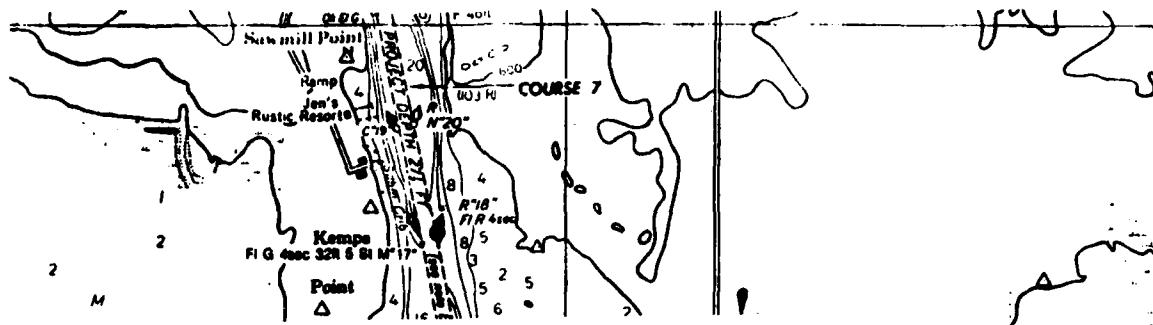
LAKE NICOLET



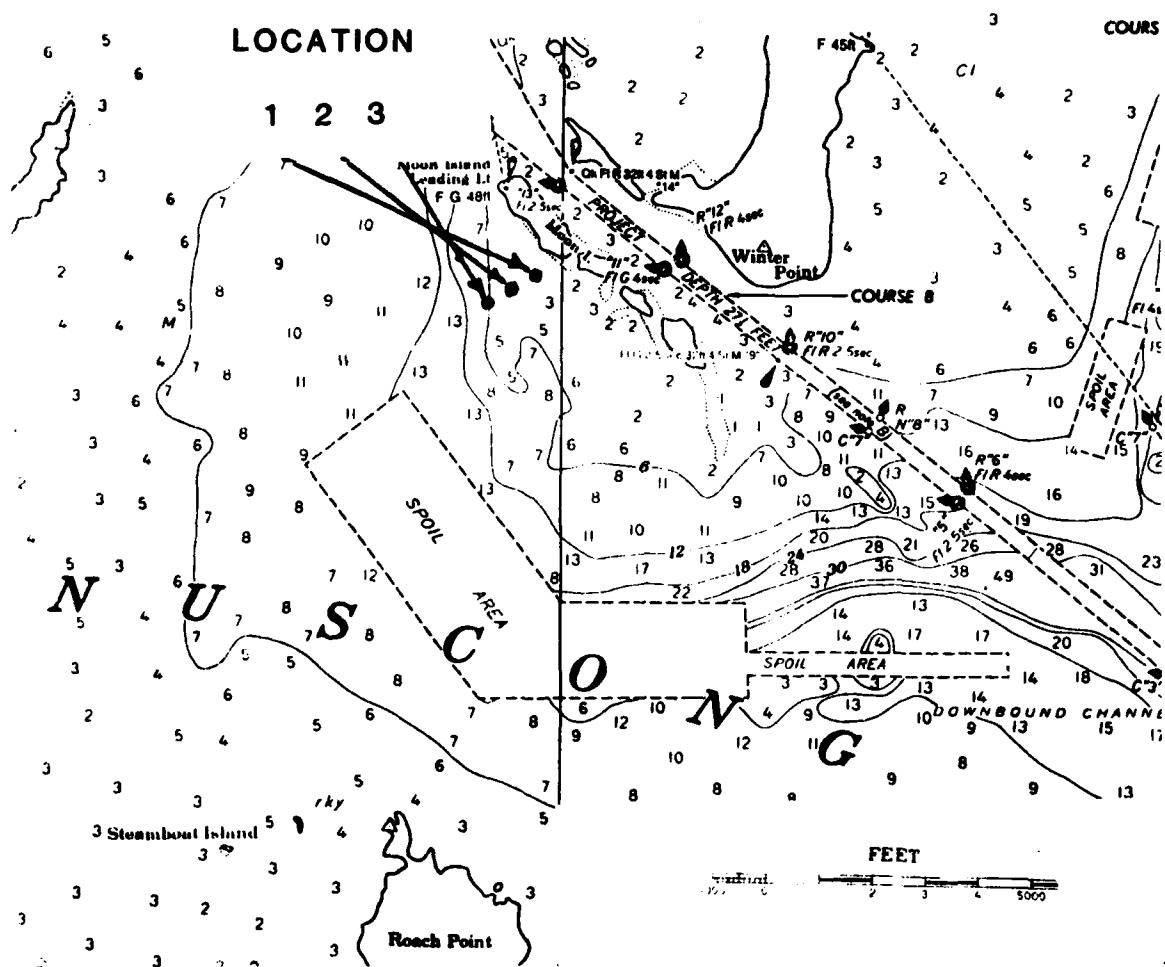
SITE LOCATION

Lake Nicolet

LAKE MUNUSCONG



Lake Munuscong Site



SITE LOCATION

LAKE MUNUSCONG